Prosperity on the Return Trip

THE outlook for fall business never was more promising, even though it is a presidential year. The law of supply and demand knows no such thing as a presidential year. In June last it became apparent among the wheat and grain consuming countries of the world that there was a very close adjustment in stocks of wheat. On June 9th our own Government report came out and confirmed the fact that we would raise no more wheat in this country than last year, if indeed as much. It also showed the prospect of a large loss in corn, the estimate being 2,515,000,000 bushels as against 3,000,000,000 bushels of this cereal last year.

This, taken together with the fact that one of the worst Congresses we have ever known to assemble in Washington, whose delight had been to sand bag business, adjourned sine die on June 9th, was the real start of a reaction from pessimism to optimism. It is now almost 60 days since the markets began to advance on food products. There has never been so opportune and prosperous an advance come to the farmer at this time of the season, coming as it does just before he has harvested his crops, so that he is today enjoying the full benefit of the advanced prices.

Of course there are many hesitant, dyed-in-the-wool bears who don't yet believe that prosperity has returned. We would ask their consideration of the following figures: During the month of July, Kansas City received 14,210 cars of wheat, aggregating almost 20,000,000 bushels, for which they received in the neighborhood of $25,000,000. Last year Kansas City received 6,000 cars of wheat, aggregating 9,000,000 bushels, for which they received less than $9,000,000. The net gain to the agriculturist is $16,000,000 on this little July transaction alone.

The advance in hogs has been equally spectacular; nothing like it has been known since war days. On Monday, July 14th, hogs sold in Chicago at $7.25; on Tuesday, July 15th, at $11.15 per cwt. As one big Chicago merchant said, recently, "The farmer is getting his. Let's go!"

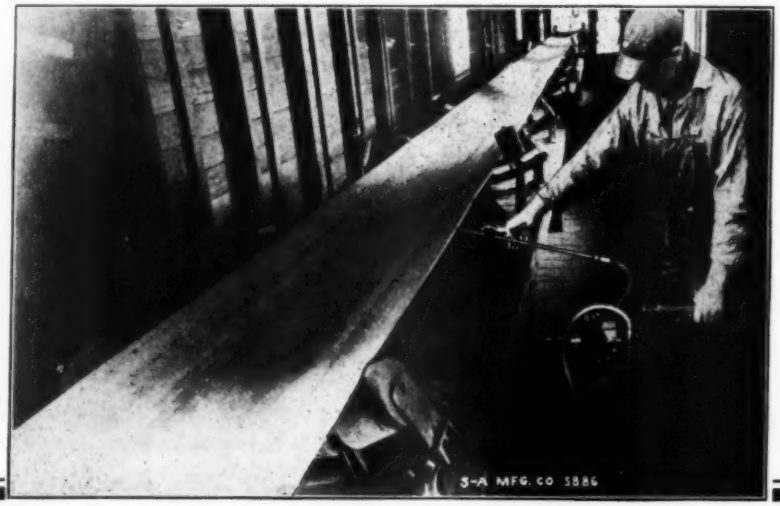
The Statistical Dept. of the Saturday Evening Post, as well as some of the largest representative newspapers in the country have come out with statements that so far the advance means a net gain to the farmers in the neighborhood of $1,500,000,000 over last year.

Jim Hill, the pioneer president of the Great Northern R. R., used to say that the railroads could make good times or bad times in this country, depending upon whether they spent a billion dollars for equipment or not.

But the gain to the farmer is not alone in the advanced price he is getting for his products this year. A year ago everything that the farmer had to buy was 25% to 40% higher than today; and everything he has to sell is 30% to 50% higher now than it was a year ago. So the adjustment of his difficulties, which was the necessary prerequisite to stability and prosperous times, has been made. If it comes to pass, as it looks at this writing very probable, that the French and Germans will come to an agreement and make effective the Dawes Reparations Commission Plan, PROSPERITY, spelled in capital letters, will be the order of the day.

We have brought the above situation to your attention because prosperity to agriculture means prosperity to industry. With the prosperous agricultural conditions that we have today, we can confidently predict prosperity in business conditions for the coming fall and winter. The paper business should share in this general return of prosperity. The prices on all commodities are rising. The demand for them is increasing.

This is the time to buy your commodities—BUY NOW!



S-A Unit Ball Bearing Conveyor Carriers

For frequent lubrication of conveyor carriers the high pressure fitting is a great convenience. The S-A Unit Carrier may now be furnished with provision for the application of the lubricant thru standard fittings. The new style pulleys may be mounted in the old brackets. The old and new pulley units are completely interchangeable.

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IF EVER A BETTER BELT CONVEYOR CARRIER IS PRODUCED IT WILL BE BUILT BY S-A ENGINEERS

EDITORIALS

Association Changes Plans

THE American Paper and Pulp Association has made two important announcements during the past month. One is that the fall business conference which has been held in Chicago each year for the past five years has been abandoned this time, and the other is the setting forward of the date of the regular annual meeting in New York City from April, 1925, to Thursday of the week beginning February 2nd. It is expected that the affiliated associations will hold their meetings, as usual, during the first three days of the same week.

Reasons for the abandonment of the fall conference have not been stated, but they are likely the result of unfavorable opinion on the part of strong groups in the Association that the expense of holding the meeting really justifies doing so. The purpose of having the annual meeting take place in February is to make it come as near after the inventory period as possible, and to enable the industry to go forward in earlier anticipation of the year's business than has been possible heretofore by holding it so late in the season.

If it is intended that there will be an indefinite abandonment of a semi-annual meeting in Chicago, we feel that such an action will be a mistake, as the industry needs this conference at the mid-period of a business year. Then, too, the holding of this meeting in the midddle west has been a service to the mills that are nearer to that section than they are to New York. We have said before and continue to believe that the industry as a whole would be greatly benefited by having an office located in Chicago, where closer contact could be maintained between the mills in that section and the activities of the Association. There are enough mills in the Great Lakes region and the far west to justify such an office, with an assistant secretary of the Association in charge.

Recollection is brought to mind of the eventful meeting of the Second Fall Conference, held in Chicago in November, 1920, when birth was given to the Woodlands Section. The enthusiasm of that meeting will long be remembered, and the predictions were that this section of the American Paper and Pulp Association would be one of its most active branches. As far as the officers of this section are concerned, they have been all that was expected of them —more so, in fact—they have been dynamic in their efforts to serve its members. But now comes the announcement that the Executive Committee of the Association is compelled to temporarily withdraw its financial support of the Section's activities, because of its own limited funds. We contend that something should be done to retain this valuable branch in our industry, for without the wood pile, where would the industry be?

There is a place in the pulp and paper industry of the United States for this active department to study the woods problems of the industry, to present the ways and means of practical advancement, and to insure the permanency of the industry by adequate forest fire prevention, forest management and reforestation.

O. M. Porter, Asst. Secretary of the American Paper and Pulp Association, says "the day is surely coming when the pulp and paper industry of the United States will have to practice forest protection and forest management. The industry needs a woodlands section or a woodlands committee with sufficient foresight to appreciate the necessity of these things, as well as the necessity of a co-operative exchange of information along these lines. How long will we continue to 'let George do it,' and then how soon will we find the cupboard bare?"

Good News for the Kiddies

IT has been hard for us to speak up and say that Christmas trees are an economic prodigality. We have been kids—and some of us believe that we still are. It has been our hope that some practical method of raising trees for this purpose would be found and that this beautiful and sentimental symbol of Christmas time would be preserved in its reality without having to find a substitute.

Now comes the information that the Northeastern Forest Experiment Station is trying out the possibility of growing trees purposely to supply that market. In a plantation of two-year-old Scotch pine that the Station has just initiated for experimental purposes in co-operation with the Forestry Department of the Massachusetts Agricultural College at Mt. Toby, Mass., Norway Spruce seedlings have been also planted, on half the plots, at the centers of the squares formed by the six by six foot spacing of the young pines. Here it will be possible to test out the feasibility of raising Christmas-tree stock in mixture with a pine plantation, the spruce to be removed when it is large enough for ready sale.

Save the Rags

THERE is a nation-wide shortage of rags, and Secretary Hoover has been petitioned by the writing paper manufacturers to assist them in developing a reserve of them to meet an unprecedented lack of this essential raw material.

"Some of the mills," said Secretary Naylor, in discussing the situation, "are operating with only three or four days' supply ahead, and this at the dullest season of the year when the mills are not operating on a full schedule. We are hoping that the Department of Commerce, as a means of aiding an American industry, will be able to do something to alleviate the present shortage."

We are expecting any day to read an announcement from Washington of a new mechanical or scientific principle, which, it is rumored, is the equal of the stationary steam engine, the steam locomotive, the dynamo, and the internal combustion engine. A great age of invention!

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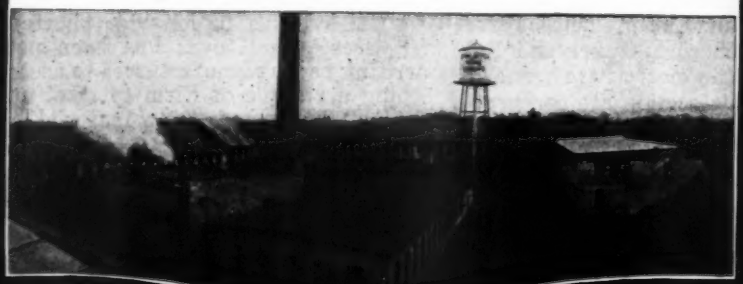

THE PAPER INDUSTRY

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Evaluation of Tannic Acids for Paper Coloring

By E. SUTERMEISTER

IN COLORING certain types of deep-colored papers in which basic dyes are used, it is desirable to employ tannic acid, or some form of tannin-containing material, to assist in fixing the dye and in obtaining the desired depth of color in the paper. Since materials sold under the name of tannic acid vary enormously in quality, it becomes of considerable importance to be able to ascertain their relative value for this purpose, but when it comes to a question of testing it will be found that most of the published information relates to their evaluation for tanning purposes and that very little is said about their dye-precipitating power. While there are a number of methods for testing tannic acid for different purposes, one manufacturer of this material admits that there is no reliable test which will apply in every case, in spite of the fact that it has been used for dyeing since the time of the ancients.

This was the state of affairs which confronted the writer recently, when requested to compare different grades of tannic acids, and after trying a number of methods, it was decided to bring them together in published form in the hope that the information contained might be of assistance to some other person under similar conditions.

Acting on the advice of one manufacturer that the method of testing should be as nearly as possible like the practical way in which it was used, two methods of actual dye precipitation were tried out. These methods were proposed by Becker[1] and Wilhelm[2], respectively, and are described briefly in Knechit, Rawson & Loewenthal, "Manual of Dyeing," 2nd Ed., Vol. 2, p. 805. Becker titrates a methyl violet solution with one of tannic acid, at 50° C., until a small portion filtered through a good grade of filter paper gives a colorless filtrate. Wilhelm uses methylene blue in slightly ammoniacal solution in a similar way but gets the end point by spotting the solution on a piece of filter paper. Both compare the sample in question with the results obtained with pure tannic acid which has been previously dried at 100° C.

Both of these methods were tried with several samples of dye and with at least two grades of tannic acid, a commercial and a chemically pure sample, but no satisfactory end point could be obtained. The chief difficulty seemed to be that the precipitate was so finely divided that it passed through the filter paper, even when the so-called "hardened" paper was used.

The principle of the next method tried was suggested by a manufacturer of dyes and was briefly as follows: Ten grams of bleached sulphite were reduced to a pulp in 750 cc. of water and the whole brought to a boil; 0.3 gram of tannin in 15 cc. water was then added and the boiling continued exactly 3 minutes, after which the mixture was allowed to stand while cooling to room temperature for three hours. The mass was then filtered as dry as possible on a Buchner funnel, but not washed, and the moist fiber added to a solution of 10 grams ferrous sulphate in 750 cc. water. This was kept at the temperature of the steam bath for half an hour with frequent stirring and the fiber than filtered on a Buchner funnel and given one wash with hot water. The fiber was then made into sheets which were dried on a steam-heated cylinder and compared for color. As standards for strength sheets were made up in which 0.5, 1.0, 2.0, 3.0, 6.0 and 9.0 percent of pure tannic acid on the air dry weight of the fiber had been used. The depth of gray or slate of the dried fiber is supposed to be proportional to the amount of actual tannic acid in the sample used, and the standard sheets made with pure tannic acid actually showed a distinct

[1] Chemical News, Vol. LI p. 229.
[2] Jour. Soc. Chem. Ind. 1898, p. 957.

gradation in color from the weakest to the strongest.

This method of testing was severely criticized by two manufacturers of tannic acids who considered that it did not give the true color precipitating value of the samples. It is their contention that only a part of the tannin is taken up by the fiber when treated in this way, a considerable proportion remaining in the bath, which cannot be completely exhausted even by adding fresh fiber. This is confirmed by the observation that the filtrate from the tannin-treated fiber still contained material which developed a deep color upon the addition of ferrous sulphate solution. They state further that tannin is not a uniform body, but contains different acids, depending upon the raw materials from which it is made and that the raw materials also vary considerably, depending on season and sources. It follows, therefore, that a tannin giving an intense color, or which has a strong affinity for sulphite, will give a stronger test by this method than one giving a paler color or having less affinity for fiber, although the color precipitating value of the two may be equal.

These criticisms seem to be entirely justified, but before they were received, tests of three samples were made by this method and the results will be given later in comparison with those obtained by another method.

A third method proposed by a manufacturer of tannin is as follows: Two grams of tannic acid are weighed and placed in a 500 cc. graduated flask with 50 cc. of warm water which is heated to dissolve the tannic acid completely. After cooling, 350 cc. water and 10 cc. of neutral 10% lead acetate are added and then more water to bring to the mark. After shaking, the solution is filtered and 50 cc. of the filtrate taken for testing. To this 5 grams of neutral sodium sulphate are added and the solution titrated with tenth-normal sodium hydroxide, using phenolphthalein as an indicator. For comparison, the same test is made on pure tannic acid which has been dried to constant weight at 100° C., and from the relation of the two titrations the value of the sample may be calculated.

The writer has not tried out this method, but it appears to be open to the criticism that while it may determine the amount of acid present it does not necessarily establish the color-precipitating power of the sample.

The final method tried was one supplied by Mr. Gilbert L. Clark. This is as follows: Make up a solution of 0.1 gram methylene blue and 0.2 gram tartar emetic in 200 cc. distilled water. Heat to 50° C. and titrate immediately with a 1 per cent solution of the tannin material until the dye is completely precipitated. This end point is ascertained by pipetting 2 cc. of the test solution through a small filter paper and noting the color of the filtrate, which will be colorless at the completion of the reaction. If many 2 cc. portions have to be tested before the end point is reached, it will, of course, be necessary to make a correction for this.

Tests by this method were made on pure tannic acid and on three samples of commercial acid which were supposed to be of the same quality, and no difficulty was encountered in finding the end point. The four samples gave the following results:

Sample	Lbs. tannic acid per lb. blue
Pure acid	1.50
No. 1	2.24
No. 2	3.90
No. 3	2.60

These same samples were also tested by the ferrous sulphate method which rated them in the same order but with somewhat different values. If the pure acid is supposed to have a value of 100, the other three would be rated by the two methods as follows:

Sample	Clark method	Ferrous sulphate method
1	67.0	75.0
2	39.8	35.0
3	57.8	72.5

These results show the necessity for testing commercial tannins if satisfactory values are to be demanded or if uniform results in use are to be expected.

So far as can be judged from the amount of work done, the Clark method is rapid and satisfactory for this purpose and it can be recommended to those who need to determine the color precipitating power of tannins. It also has the advantage that it has been approved by the two manufacturers of tannins who were kind enough to help with advice during the course of this work.

The Controlling Factor

Two young men about the same age graduated from the same college and were employed by the same company about the same number of years. Colonel Leonard P. Ayres of the Cleveland Trust Company tells about them. One of these men receives a salary of $3,000 a year and the other gets $23,000, but if both were to take an examination in their knowledge of their business their marks would be about equal. Colonel Ayres asks, "What is the controlling factor in the earning power of individuals?"

The colonel answers his own question by saying it consists in the ability to influence the actions of others. It may be described more fully as the ability to see things from the other person's point of view and to persuade the other person to see things from your point of view.

"I am sure that it is because one of these young men possesses this quality in large measure," says Colonel Ayres, "while the other one does not, that one of them earns so much more than the other.

Economical Paper Production Possible with Proper Use of Exhaust Steam

Dirty Rolls, Wet Felts, Oil in Exhaust Steam and Faulty Traps Increase Production Costs and Decrease Paper Tonnage

By JAMES T. BEARD, 2nd

The author's last article made an attempt to indicate the dollars and cents value of exhaust steam from the main engine and from the auxiliaries in the paper mill power plant, and to point out the desirability of using it in some useful way in order to reclaim some or most of this value. The purpose of the article this month is to show what happens when exhaust steam is improperly used for heating the dryer rolls and to outline a few suggestions for using this steam most effectively and with greatest economy.

ONE of the chief uses for exhaust steam in the paper mill is for the heating of the dryer rolls of the paper machine. The steam for these rolls is usually supplied from the exhaust of the main engine. Since the paper production of the plant depends upon the speed and effectiveness of the drying process as the paper passes over the rolls, the efficiency of these rolls as a heating medium is a vital factor in plant operation. Provision is also made, therefore, for supplying the dryer rolls with live steam, which can be used if the exhaust steam does not dry the paper fast enough.

The practice of using live steam in the dryer rolls, however, is costly. It throws a greater load upon the boilers in the plant and represents a loss of fuel in proportion to the amount of live steam used.

Emergencies do arise, nevertheless, when the machine tender must open up the live steam to dry his paper. That is, he thinks he must. And, as a matter of fact, there is little else that he can do at the particular moment, except use live steam. And when these conditions arise, he uses it and lots of it.

But the use of live steam in the dryer rolls may have other serious effects, besides merely increasing the coal bill for the month. Suppose, for example, the pressure of the steam in the exhaust line is normally kept at 5 pounds gauge. This means that there is a back pressure of 5 pounds on the main engine. If this engine is designed to run at this back pressure and develop the horse-power required to run the mill at its proper speed, then everything is all right.

If, however, the machine tender suddenly decides to open live steam into the dryer rolls, it means that the high pressure steam valve is opened, perhaps, only a crack, and high pressure steam is being turned into the dryer. This may cause the pressure in the low pressure exhaust line to build up to, say, 8 pounds. And the back pressure on the engine is increased.

The effect of back pressure on the engine is just the same as the effect of the muffler on your automobile engine. If you cut out the muffler you get more power and higher speed. Likewise, if you cut down the back pressure on the steam engine, you get more power out of the engine for the same amount of steam used. And the contrary is also true. That is, if you increase the back pressure on the steam engine you decrease the amount of power you get out of it.

Consequently, when the machine tender opens up the live steam into the dryer rolls, the back pressure on the engine builds up, the horsepower developed by the engine begins to drop off and the engine speed and the machine speed begin to fall. As soon as this happens, the governor on the steam engine lets more steam into the engine cylinder, in order to keep up the speed.

The first effect, therefore, of using live steam in the dryer rolls is to cause the engine to take more steam from the boilers, in order to keep the paper machine running up to speed. And more live steam for the engine means higher coal consumption, bigger coal bills and poorer economy for the plant.

Suppose, for example, the steam used by the engine increased from 25 pounds to 30 pounds to develop one horse-power for one hour. Then the 150 horse-power engine that we were talking about in the June article would use altogether 4,500 pounds of steam an hour, instead of 3,750 pounds.

Cost of Using Live Steam

In order to find out just what this means, let us translate it into dollars and cents, just as we did in the previous article. Assuming that it is costing you 60 cents for every 1,000 pounds of steam made in the boiler house, it takes $2.25 worth of steam (.60 x 3,750) to run your engine for one hour at, say, 5 pounds back pressure. Now, if the machine tender turns live steam into the rolls and builds up the back pressure, as outlined above, the engine is using 4,500 pounds of steam, which is costing $2.70 an hour, an increase of 45 cents an hour, $10.80 a day, more than $300 a month.

And remember that is just for a small 150 horse-power engine. You may have several of such en-

gines. Or your engines may be much larger. If so, it may be costing many times this much to run your engine against an excessive back pressure.

And these figures do not count at all the live steam which is turned into the rolls themselves, and which really causes the excessive back pressure. There is no telling without actually measuring, just how much steam is being used to dry the paper. Some days it may be more; others it may be less. Whatever it is, it is costing real money.

I am not saying, do not use live steam in the dryer rolls. But I do say, do not use live steam for drying your paper, thereby increasing your cost of production very materially, unless you are sure there is no other way out for you. I am not a paper maker. But I have had charge of the power plants of some important paper mills. I know the necessity for having proper paper drying and efficient paper drying, no matter whether it takes live steam to do the job right or not. I would never argue with the machine tender on that point.

But I also know that many paper men know as little about making steam and using it as I do about making paper. And the problem I am talking about in this story is not a paper problem. It is a problem in making steam and in properly using it to attain the highest operating economy possible with the equipment.

Put it up to your chief engineer, or your operating man. It's his job. I have heard many chiefs growl and grumble about how the machine tender opens up the live steam and puts him in a hole until he can get the pressure back up again. And I can sincerely sympathize with them if they follow up their grouch with an earnest attempt to co-operate with the production end of the mill and to correct the things that are wrong and set things right. But if they are satisfied to carry the grouch and to let it go at that, they are laying down on the job.

I was chatting in the boiler house one day with the head fireman of a small mill that turned out 30 tons of paper a day. He was a real sociable sort of a chap, not very intelligent, but always on the job, and made altogether a pretty fair fireman.

"There she goes again," he said, pointing to the steam gauge.

I glanced up and saw the needle steadily dropping back. In less than two minutes it was off 10 pounds, and still dropping.

"Some days it makes us sweat blood to hold steam, the way they open up on us in the mill room. The chief says he can't do nothin' about it. Says it's none of his business, anyway, and if I couldn't keep up steam he'd have to get some one as could."

I said nothing, but after I left the boiler room I went in to see the chief.

"How's the new engine doing, Pete?" I inquired.

"She sure does run fine, Mr. Beard, but I'm kind of disappointed. From what the engine people told me I thought she was going to use a lot less steam than the old one and help us out in the boiler house. I'm thinking of sending for a man to come here and see for himself that she ain't doin' what they promised."

"Before you write that letter, Pete, come out to the machine room with me."

We looked at the back-pressure gauge and it showed 15 pounds. And then I told Pete, without rubbing it in, that if his engine wasn't using so much more steam than it ought to, the fireman in the boiler room could keep a better steam record. And I showed him that the reason that his engine was using more steam than it ought to was because of that high back pressure. In other words, it was his engine that was gumming the whole works in the boiler house. And it was not the engine's fault. But I put it right up to the chief, for allowing conditions to exist that made the high back pressure necessary. And to cap the climax, I told him that this was costing the boss more than $500 a month. If the boss ever found that out he sure would raise Cain.

Well, that little talk had its effect. We got together with the superintendent and machine tender and told them we wanted their help and their advice. We had to get them with us and we were ready to let them have their share of credit for any results we accomplished. Before we got through we brought that back pressure down to 8 pounds; we used practically no live steam in the dryer rolls; and we made the boiler house a decent place to work in.

Keep Roll Surfaces Clean

The supply of exhaust steam may not be sufficient for heating the dryer rolls of a paper machine, depending upon the efficiency in using it. First, the surfices of the rolls should be clean or the heat from the steam in the rolls does not easily pass through them to the paper. Where rolls are fouled up, the rate of drying of paper is slower and excessive quantities of live steam at a higher back pressure may be necessary.

Dryer rolls become scaled up on the outside from time to time during the operation of the mill. The roll surface thus becomes rough and does not permit a close fit between the paper and the roll. If the roll is thoroughly clean on the outside, the paper hugs the roll surface tightly, it absorbs the heat from the steam readily, and the drying of the paper is much quicker and more efficient.

For the sake of efficiency and economy, for reducing production costs, and for maintaining the standard of maximum mill production, some sort of systematic schedule should be adhered to for roll grinding, thus maintaining the efficiency of the rolls as a heating unit. How often this should be done depends entirely upon the conditions at each particular plant, and upon the paper that is being produced.

The dryer rolls can also get dirty from the exhaust

steam on the inside. When the interior of a roll is fouled, the effect on its heating efficiency is the same as if it was scaled up on the outside.

Steam that is exhausted from the engine carries with it some of the oil that has been used to lubricate the piston and cylinder surfaces. If this oil is carried into the dryer rolls, it deposits on the surfaces and forms an insulating film which prevents efficient heating. It requires only a small oil film to materially interfere with the drying of the paper.

Making Oil Separators Function

For this reason, an oil separator is always placed in the exhaust steam line between the engine and the dryer rolls. The purpose of such a separator is to remove oil from the steam as it passes through. Many engineers make the mistake of assuming that there is no oil in their exhaust steam which goes to the rolls, just because they have a separator in the line. That would be true if the separator were doing its work right. But unless they are inspected from time to time they get fouled, or for other reasons do not function properly.

Where the separator is kept in good condition and properly drained, the exhaust steam to the dryer rolls may be assumed to be free from oil, and the cleanliness of the rolls on the inside is assured. But don't make the mistake of assuming that the separator is working right just because it is there.

One other thing that has a very important bearing upon the quantity of steam needed for the dryer rolls is the condition of the dryer felts. It pays to have dry felts, because they reduce the heat required for drying to a minimum, thereby also reducing the necessity for using live steam in the rolls, except in emergency.

Changing felts is a big job. But if felts are allowed to remain too long on the machine, it may be costing you $500 or even $1,000 a month to keep them on. It is not for the chief engineer to dictate as to the changing of the felts on the paper machine—not by any means. But if he comes to you some day in the spirit of proper co-operation and makes a suggestion in this respect, it might be costing you real money to turn him down without hearing him through.

Inspection of Steam Traps

In every paper mill there are many mechanical contraptions, usually stuck down under the floor, or away in some dark corners, where nobody can find them, even if they wanted to. The man that built the mill put them there. And, unless your plant is an exception, they are a sorry lot of contrivances.

I refer to the steam traps. These traps are built to let water pass through them, but they hold back the steam. Dryer rolls are fitted with such traps, which let the condensed steam pass out as water but keep the steam in the rolls. At least, that is what they are supposed to do. And it is what they actually do if they are working right. But nobody pays much attention to them. They get out of kilter. They leak. And eventually they send as much steam to the sewer as water.

When steam is blowing through the traps on the dryer rolls, it certainly is not doing its full share of work in drying paper. The machine tender opens up the live steam and there is more work to be done in the boiler house, while the coal bill goes up.

In one mill I found a machine tender who had actually found one of the traps. He was as proud of it as if he had discovered America. He showed me how he had opened up the bypress valve on the trap and let the steam blow through to dry his paper quicker. In this particular case the trap was all scaled and plugged. It wouldn't work at all, and they had the dickens of a time drying paper until the machine tender found the way to cut the trap out altogether and let the stream just blow through.

In one respect steam traps are like oil separators. Just because you see them there don't assume that they are working properly. It's fifty-fifty they are not. There are enough traps in every paper mill, however, to warrant a systematic schedule of inspection at regular intervals, at least once a month. It's the chief's job, and it is up to him to appoint some one to do this work and to check him up to see that he does it.

To summarize briefly, therefore, where exhaust steam is not used economically in the dryer rolls, it may be, and often is, necessary to open live steam into the rolls, in order to dry the paper effectively. The live steam represents a loss at the rate of 60 cents for every 1,000 pounds of steam used.

The use of live steam in the dryer rolls, however, puts a back pressure on the main engine, which tends to reduce its power and speed. In order to keep the paper machine running at normal speed, therefore, the engine governor acts automatically to let more live steam into the engine cylinder. The engine thus uses an excessive amount of steam to do its work. This is also a loss at the rate of 60 cents per 1,000 pounds of excess steam used.

The uneconomical use of exhaust steam in the dryer rolls may be due to several causes, as follows:

1. Dirty rolls (outside, inside).
2. Oil separator not separating.
3. Wet felts.
4. Steam traps out of order.

Where the suggestions outlined are adapted to the particular conditions of the plant and intelligently and systematically followed, conditions can usually be brought about that will result in economies of steam and power that will materially affect production costs.

Where conditions are bad and high back pressure is necessary, due to improper use of exhaust steam in the dryer rolls, the wide-open position of the engine

governor may not be sufficient to carry the load. A slight increase in back pressure such as would necessitate a still further governor travel would then slow down the engine instead. The paper machine would slow down and production would fall off in proportion to the reduction in speed. It may even be necessary to shut down the entire mill.

Mill production, therefore, as well as plant economy and production costs depend upon the proper use of exhaust steam in the dryer rolls of the paper machine. Not until all of the exhaust steam available has been used and used efficiently should it be permissible to use live steam. The problem is one worthy of the careful thought and consideration of those in responsible charge of paper mill production and its proper solution will bring big dividends.

Waste in the Pulp and Paper Industry

Pumping Equipment

By B. T. McBAIN

Third Vice-Pres., Superintendents' Association

THIS seems a small subject, and it is evidently so considered by many pulp and paper mills, for one can find more kinds of out-of-date pumps in use than any other kind of inefficient machinery and there are many other kinds in use as well.

Paper cannot be made without water. Water is the conveyor for handling the fiber, and the pump the means of moving the conveyor.

This water conveyor is used many times before the wood fiber is removed the last time and made into the finished product.

Water is used for many purposes, the washing of the wood at the log haul or wood conveyor, for the making of acid and other liquor at the chemical mills, for cooling the gas and acid at the acid plant, and again for cooling the reclaimed acid at the digesters.

It is used to cool the journals on wood filled grinder bearings and for pressure in the grinder cylinders. Again it comes into play to dilute the pulp at the grinders and blow pits, for screenings and at the deckers and wet machines. It is used when furnishing beaters and when dropping same. It is used on the paper machine screens, on the paper machine showers, both wire and felts, also at the journal boxes and calenders, and for water finished papers, is put back into the sheet at the breaker stack.

It is also used at the boilers to make steam.

All this water must be pumped, and in most mills it is being pumped with the most outlandish equipment one ever saw. Some mills are even using water from their fire systems pumped by steam cylinder fire pumps, probably the least efficient as general service pumps of any possible to use.

Some have pumps that were put into the plant fifty years ago and don't know who made them. "They must be good pumps or they couldn't have lasted so long."

Some have small pumps running at break-neck speed where larger, slower pumps would do the work with one-half the power.

Some have large pumps connected into small pipe lines and wonder why they will not pump the required amount of water, or the water which the guarantee shows they should pump at a given speed or horsepower.

Some have separate fresh water pumps for each machine and beaters, a four-machine mill probably having six or eight fresh-water pumps all pumping against pressure and wasting power, belts, lubricants and mechanic's attention, while one good properly designed pump would do the whole job with one-quarter to one-sixteenth of the power.

Others have two or three white water pumps where one could do the whole performance to better advantage and at a saving in all these items.

Then there are vacuum pumps of various makes and designs running at unheard of speeds, wasting power and not doing the work expected because they are out-of-date or not operated as designed.

There are plunger pumps for stock running at speeds twice what they should, and as a result causing expensive upkeep bills and great loss in power.

I am a fervent believer in the pump engineer. I think a proper pump engineer can go into most any plant and change 90 per cent of the pumps in use, saving 50 per cent of the power without half trying and on belts, repair material and labor, together with power, save their cost almost every year they are operated, if not more, than do so.

I have seen pump engineers who would guarantee to do this or take out their pumps, but if you get one to look over your problem, don't expect to get results unless you change the piping the way he orders it done, because a pump cannot do the work for which it is designed unless you have pipes with proper valves and fittings also properly designed.

This is a big subject—a big waste subject—a big loss to the pulp and paper industry.

The power of the press often goes to waist.

Wood Preparing Equipment

By HARRY E. WESTON

Assistant Professor of Pulp and Paper Manufacture, The New York State College of Forestry, Syracuse, N. Y.

This is the fifth installment of Mr. Weston's article on Wood Preparing Equipment. The series will continue through a number of succeeding issues of this magazine.

Chipper

IT IS necessary in the manufacture of chemical pulp to reduce the wood bolts to suitable form for cooking. Numerous investigations for the determination of proper size and form of material best suited to the chemical reactions of the various processes, as well as in the design of equipment for the reduction of the wood to this size and form, have been made. Experiments of sawing the blocks into sections of the right size were tried but with very poor results. Such a method proved to be very wasteful and slow. Up to the present, reduction of the blocks to chips that are from ½ to 1 inch in length and ⅛ to $\frac{3}{16}$ of an inch in thickness has been found most efficient. The chipping is done in a machine which gives to the block a slicing cut approximately at an angle of 45 degrees. This type of cut allows the natural pores of the wood to remain open and at the same time presents to the action of chemicals a much greater penetration surface than would be possible if cut at 90 degrees since penetration takes place through the ends of the chips. This machine is commonly designated as a chipper. It is somewhat similar in design to the knife barker with the exception that the disc is much heavier and will develop greater inertia.

A number of chippers with the same principle underlying the construction of all of them are on the market. Various sizes have been built by manufacturers to meet the needs of different mill conditions. Chippers made to handle bolts of not over 4 inches in diameter are sometimes used in experimental work, whereas bolts up to 18 inches in diameter are handled by some of the commercial chippers.

The main parts of a chipper may be enumerated as follows:

1. Frame or Chipper Bed.
2. Disc.
3. Shaft and Bearing Boxes.
4. Knives.
5. Spout.
6. Hood or Bonnet.
7. Drive Arrangement.

The frame or chipper bed is an important part of the machine, as it is necessary for it to support the very heavy working elements. It is constructed of cast iron and may be of one or more pieces. The actual design will vary with manufacturers, but must in all cases be of sufficient strength to resist the strain caused by the force of the knives striking the wood. The frame should be so arranged that it can be easily lined up before concrete is run underneath and when set up must give rigid and permanent alignment of the working parts.

The disc, as in the case of the disc barker, must be very carefully designed. Great strength, strong flywheel effect, and perfect running balance are three essentials which must be considered in the design of the disc. Great strength is necessary to resist the strains induced by the centrifugal force of the disc and the force with which the knives strike the wood. The disc must have sufficient weight to maintain the desired flywheel effect to insure steadiness in operation. It is commonly of close grained, high tensile strength cast iron and, as in the case of the disc barker, usually has a rim of wrought iron or steel, shrunk on the outside as an additional safety factor. Annealed cast steel is used in the construction of one design of disc. The slots in this disc, where chips pass through after being cut, are protected with guard angles made from cast steel. (These angles are of different design than the well-known face plates of other chippers.) This disc is counterbored and machined to receive boiler plate segments which fit between the knife holders in such a manner as to cover its entire face. These segments are secured by riveting to the face. Scouring clips, to prevent chips from banking against the disc—causing it to heat during operation, are attached to its outside diameter.

The diameter of the disc may vary with different designs from about 30 inches for experimental work to 106 inches in commercial work. One of the smallest commercial chippers, designed to handle slabs, edgings or small diameter wood, as well as for rechipping oversize chips, has a disc 47 inches in diameter while one of the largest chippers has a disc 106 inches in diameter. In the disc are cast the knife slots—three or four in number—arranged in such a manner that when the knives are placed they cut most efficiently. The location of the knife slots and knives in a typical chipper is shown in the accompanying illustration.

The weight of the disc should be sufficient to maintain the desired flywheel effect. This flywheel effect, as mentioned previously, insures uniformity in speed and steadiness in operation. An 88 inch diameter disc, 4 inches in thickness, of a well-known make of

chipper, weighs approximately 8,000 pounds. Such a disc must of necessity be accurately balanced at speed to insure absence of vibration—thus preventing to a great extent the racking of bearings. It is provided with a substantially large hub which is normally secured to the shaft by steel keys. The hub is

Typical Chipper Installation

ordinarily bored for press fit. Due to this type of fit 70 tons pressure is sometimes required to force the shaft into position.

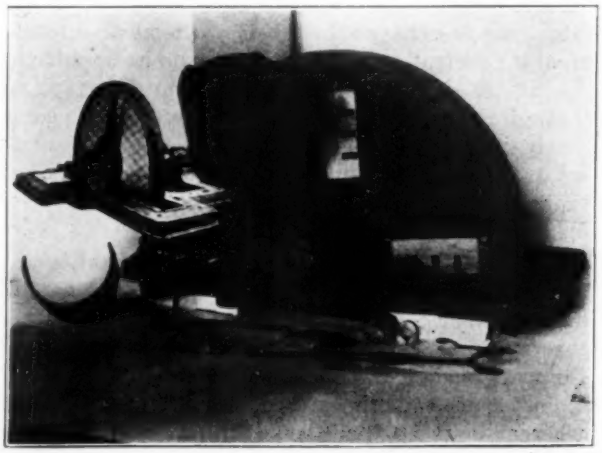
A chipper is usually designated by using the diameter of the disc, for example, 47 inch, 60 inch, 84 inch, 88 inch, or 106 inch, together with the direction of the drive, as right or left hand. The location of the spout will show whether the machine is right or left hand. If the spout is on the left side of the shaft when one is looking at the machine from the front, it is left hand and the disc revolves counterclockwise. If the spout is on the right of one standing in the same position, the chipper is right hand and the disc revolves clockwise.

The shaft is made from a forging or of hammered steel. It is commonly of large diameter (approximately 4 inches to 8 inches, depending on the size and make) and is often of short length so that it may more easily withstand the violent jolts that it receives. The shaft of a well-known 88-inch chipper, made from an open hearth forging, is 7¼ inches in diameter on the disc fit, 6¾ inches in diameter on the pulley fit, 6 inches on the journals, and 6 feet 4 inches in length. Such dimensions are simply given to emphasize the importance of strength in the design of a chipper shaft.

The combined weight of the disc and shaft, together with the strains to which the machine is subjected during operation, require utmost care in the design of supporting bearings which are attached to the base or frame of the machine. In fact the design of satisfactory bearings is probably secondary only in importance to the design of the disc. The bearing boxes must be heavy and strong and must have a bearing surface of considerable size. They are normally made of cast iron and lined with high-grade babbitt metal. Many chippers are so designed that the chipper shaft is supported for approximately one half of its total length. The shaft and chipper disc are sometimes supported by an auxiliary bearing—this bearing being placed directly behind the chipper disc in a somewhat central position on the shaft. Such a bearing is supported by the base casting.

It is necessary to arrange the shaft for endwise adjustment so that the space between the disc and the working face of the spout may be regulated, and at the same time the heavy end thrusts of the machine during operation must be absorbed or taken up. Various devices are used to accomplish these ends. Adjustable thrust blocks of bronze, backed up with iron or steel thrust plates which cannot turn, are often placed integral with the main bearings. Sometimes bronze thrust collars and wood fibre discs are used to take up the end thrust of the shaft. The necessary safety plates and screws for adjustment are located on each end of the shaft. These plates are so designed that if iron gets into the chipper the plates will break, relieve the strain from other parts of the machine, and thus prevent serious damage to the equipment. Such a plate can be replaced in a short time with comparative ease.

It is imperative that chipper knives be made of the right kind of properly heat-treated steel. The knives must be hardened and tempered for the work they are expected to do. It is much easier for a knife



LARGE PICTURE—Front view of Chipper with Hood Removed Showing Location of Knives in Disc. (Courtesy Carthage Machine Company.)

SMALL INSET—Chipper Showing 106-Inch Diameter Disc with Removable Face Segments. (Courtesy Valley Iron Works Co.)

manufacturer to determine this requirement if the species of wood to be cut, and the condition under which the knives are to be used, is known.

The details of the individual knife design will vary with the make of chipper and with the make of knife. Naturally, they must be of such a size and have suitable means of securing them in position to fit any specified type of chipper. Some knife manufacturers

request, when ordering knives direct, that a pattern should be furnished wherever possible. It is well to send an old knife, as from such a knife any desired information may be obtained.

The knives may be made of solid or laid stock. Laid steel knives may give trouble by the separation of the layers due to the continual pounding of the knives on the wood. There is no weld or joint in solid steel knives to become separated.

The actual designs of several chipper knives are illustrated herewith. The location of the slot openings or elongated bolt holes for attachment to the disc, permitting adjustment or regrinding, are clearly shown. The beveled ends fit beveled cheek pieces which are also attached to the disc by additional bolts. The knives must be much stronger than those of the disc barkers, the average thickness being from ¾ to 1 inch with a cutting edge of from 11 to 15 inches, and a width of 6 to 8 inches.

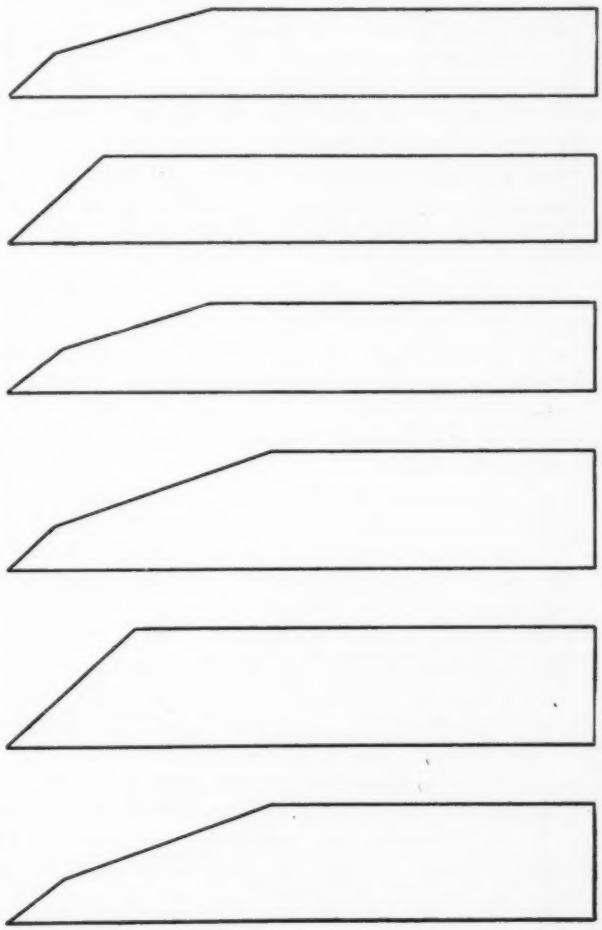
The cutting angle at which the chipper knives are ground will differ slightly with different designs. This should be determined largely by the condition of the wood. The cutting edge will not react in quite the same manner with river wood as with frozen or dry wood. A single bevel of about 42 degrees or a double bevel in which the cutting bevel is either 37 or 42 degrees are most common. There are, however, many differences of opinion as to the most efficient bevel. Mr. Theodore Safford's observations on river spruce of about 42 degrees moisture indicate that a double bevel knife of about 42 degrees and 20 degrees makes a minimum of sawdust, has a tendency to "draw" the wood with less jumping, and retains its cutting edge for the longest service.* The illustration shows bevels used on six knives, three of which are ¾ of an inch in thickness, while the remaining three are 1 inch.

The cutting bevel is frequently shortened during the winter months in the north because of the terrific strains upon it when cutting frozen wood. It is well to remember that the cutting edge is weakened if the bevel is too long, and cutting trouble results if the bevel is too short. Likewise, knives with the cutting edge ground slightly concave require less power and make less sawdust than those with the straight bevel, but they lose their edge more rapidly.

A bed knife is located below the spout proper and is so arranged that it can be removed or adjusted without removing the spout. It is located below the center of the shaft so that it works together with the disc knives to give a drawing or slicing cut. It really acts as a shearing edge for the knives of the disc.

The bed knife, as in the case of the disc knives, may be either of solid or laid steel, properly hardened and tempered and must be of heavy design to withstand the tremendous jolts to which it is subjected.

A typical design is illustrated. This knife is adjustable through two heavy set screws which are locked by a convenient clamping device. Likewise its cutting edge is securely held from vibrating by means of an ingeniously constructed lock. Such construction prevents the knife from working loose accidentally, but permits easy and quick adjustment or removal without taking off the spout. The bed knife is fitted to the spout base and should be so adjusted that a straight edge placed in the bottom of the



Several Types of Chipper Knives

spout will just nip its cutting edge. This adjustment will often permit the cutting edge to extend or project for about $\frac{1}{16}$ of an inch inside the base. The disc should be so adjusted that the knives will clear the bed knife by approximately $\frac{1}{32}$ to $\frac{1}{16}$ of an inch. Such an adjustment prevents undue wear in the spout and aids in cutting cleaner chips.

The value placed upon the design of a spout is often underestimated though it is through the spout that the wood bolts must be fed to the knives contained in the disc. The position which the wood takes against the face of the disc would be largely dependent upon the design of the chipper spout.

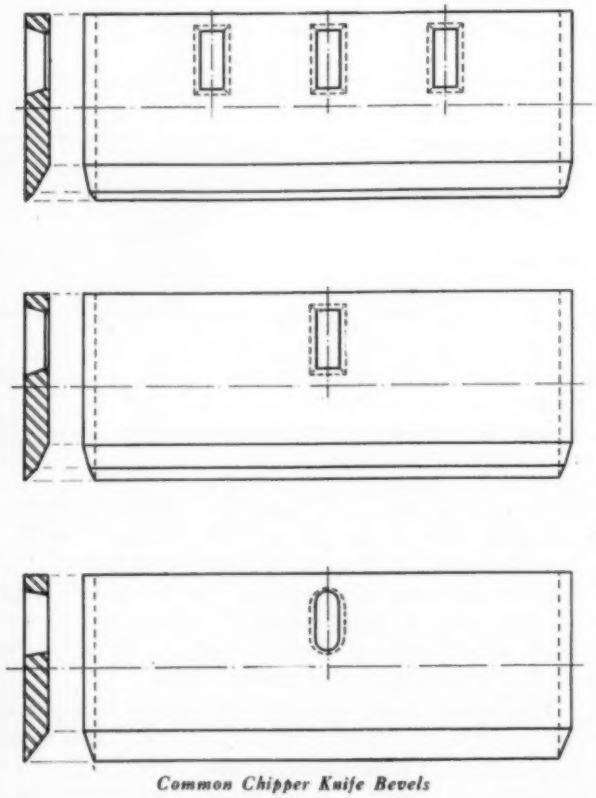
The usual type of spout is of cast iron, and of heavy construction so as to withstand the violent

*Paper, June 13, 1923—Variables of Wood Chips.

shocks to which it is subjected during the operation of the chipper. It is attached to the base and is inclined at an angle of approximately 45 degrees to the disc. Such an inclination allows the knives to strike the blocks obliquely. Some spouts are also inclined slightly (about 20 degrees) to the perpendicular toward the center of the disc so that the wood is sliced at a double angle, or it may be said that the chipping takes place downward and across the grain. Many mills prefer the round spout, and others a square type. Specially designed spouts are used for handling edgings or slab wood. The size of the spout opening would depend on the make and size of chipper. The inside diameter of an 84 inch chipper spout is usually about 14½ inches.

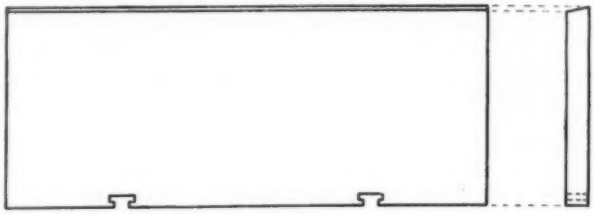
The majority of chipper spouts are lined on the wearing surfaces with steel plates or sections which can be removed whenever worn and a new lining inserted.

One type of chipper which uses no so-called bed knife has received considerable attention within the last few years. It has a cast iron spout in which the throat has been chilled and thus hardened to present a satisfactory cutting edge and to reduce wear. The cutting edge of the spout is chilled back for approximately 8 inches.



Common Chipper Knife Bevels

This spout is constructed in such a manner that it can be adjusted in proper relation to the chipper knives so that the knives pass the cutting edge, which acts similarly to the bed knife of other chippers, with a clearance of approximately $\frac{1}{32}$ of an inch. The chilled cast iron is so hard that it will hold its edge for about 30 days, when it is resharpened by grinding. Uniform chips are produced by keeping the cutting edge of the throat sharp.



Bed Knife Design

A hood, constructed of heavy gauge sheet metal and riveted to angle iron, is used to cover the disc so that good protection is given the workmen and at the same time the chips in many cases may be directed to a conveyor located under the disc. The installation of the hood is so arranged that sufficient clearance is given at all points to the revolving disc and knives. The details in construction will vary with the different makers but in all cases suitable means of readily lifting it off the machine are provided. This often consists of a simple lift bolt attached to the top center of the hood. To this bolt can be attached any form of lifting device such as a common block and tackle or chain fall. Some hoods may also be equipped with a large door which can be used for the adjustment and changing of knives without the need of raising the hood.

It is never advisable to connect a motor directly to a chipper.

A very heavy, large diameter drive pulley is securely fastened to the shaft. The diameter and face of this pulley will vary with the design and the operating conditions under which it is expected to work. An average range of diameters might be given as 24 inches to 65 inches with a face of from 8 inches to 25 inches. In some instances a tight and loose pulley are fitted to the driving shaft.

The drive pulley of the chipper is connected to the motor pulley by means of belting which aids in absorbing some of the shocks caused by the operation of the machine. The load on a chipper fluctuates greatly with the kind and size of wood fed into it. This causes the motor to be subject to high peak loads. The power required varies with the weight and the diameter of the disc, speed, condition of the knives, as well as the kind, condition, and size of wood being chipped. Power requirements will range from 20 H.P. on smaller chippers handling slabs, edgings, or oversize chips to 150 H.P. or even better on some of the larger machines. It is generally considered advisable to use a little larger motor than is deemed necessary.

The speed at which a chipper is operated will depend to some extent on local mill conditions, but it

should be so determined that a full cut will be made by one knife before the next knife strikes the wood. Ample time should be allowed for the block to settle against the face of the disc for cutting because it is essential in the production of uniform chips, and in decreasing the amount of sawdust which is made during the chipping operation. Recommended speeds may vary from 175 to 600 R. P. M., depending upon the type of chipper and the capacity desired. The question of speed, however, should not be settled by the demand for chips but rather by the quality of product which results from uniform chips. Some of the chipper manufacturers have carried out extensive experiments to determine the speed or speeds at which their equipment does its best work. In some cases, their recommendations are given with comparatively wide limits as 100 to 200 R. P. M. In other cases they are much more exacting—not allowing a variation of over 25 R. P. M. This variation is generally mentioned in excess of the speed recommended since it is quantity production that mill operation demands. A number of our larger capacity chippers operate to advantage at a speed of from 175 to 250 R. P. M.

The capacity is generally expressed in cords per hour or cords per day with the length of day specified in hours. It will depend largely upon the kind, size, and condition of the wood; the speed of the disc; the number, size and condition of the knives; and the rate at which the wood is fed to the chipper. The power unit in some instances would also influence the capacity. Five to seven cords per hour may be given as the capacity of one of the smaller commercial chippers while some of the larger chippers are handling approximately fifteen cords per hour. Probably eight to ten cords per hour could be given as the ordinary capacity of the average chipper under usual mill conditions.

The wood should be fed continuously through the chipper spout to the disc. The chipper spout is generally prolonged in the form of a chute which is often of such a length as to allow the weight of 10 to 15 feet of wood against the disc at any one time. Such weight prevents the blocks which are being cut from bounding or jumping back out of the spout and thus increases the capacity of the chipper as well as aids in the production of more uniform chips with a corresponding decrease in the amount of sawdust. It is good practice whenever possible to keep the spout completely filled with wood. This would naturally be the condition if the average run of wood was of approximately the diameter of the inside diameter of the spout. Such a condition, however, is not always of common occurrence, since much of the wood is of smaller diameter.

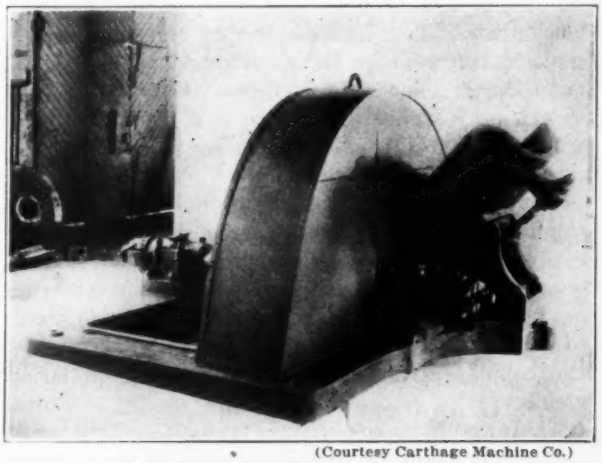
If the wood is carried to the chipper chute fast enough, a good chipper-man can keep the spout practically full at all times and thus chip more wood than would otherwise be possible. Likewise, if the spout is kept full, there will be less jumping of blocks and a more uniform chip production.

As the disc revolves, the knives slice off the end of the block resting against the face of the disc and extending beyond the adjustable bed knife. The sliced sections pass through the slots between the cheek pieces or guard angles and the knives, and drop to a chipper pit below the disc from which they are removed continuously by the use of a conveyor.

The care of the chipper should be in charge of a reliable man. It is necessary that close inspection be given frequently so that the disc may always be kept in perfect balance, the journal bearings kept in good condition, the bed knife changed when necessary, the spout lining removed when worn and a new lining inserted, and the knives changed as often as the operation demands.

Worn bed knives have a tendency to turn over the wood that is in direct contact and very poor chips are the result. It is advisable to change a bed knife as soon as it becomes necessary, but under normal conditions one will last for a considerable length of time when operating at full capacity.

The knives must always be kept sharp. Sharp knives not only cut good chips but also reduce the danger of short blocks flying back from the spout. Dull knives produce bruised chips which are rendered less permeable when in contact with the cooking liquor.



(Courtesy Carthage Machine Co.)

Left Front View of Chipper with Hood

Records should be kept on each set of knives to see whether or not they are giving satisfactory service. The knives, particularly during the winter months, must be changed frequently. Oftentimes frost or dirt in the wood will remove a cutting edge in only a short time. It is sometimes possible to touch up such edges with a file, but it is generally best to remove the knives and insert sharp ones. Sharpening of chipper knives should be in charge of one capable of the job, as it is easy to spoil a good set. Oftentimes knives giving unsatisfactory service are the result of poor grinding. Care must be taken to maintain the correct bevel and not to draw the

temper or "blue" them. The knives should be ground in sets and finished with some fine stone to remove the burr left by the emery wheel. The setting of the knives in the disc must also be carefully done since they play a big part in the efficient operation of the chipper.

Uniform chips are the result of good chipper control from the feeding of the wood to the actual maintenance of the machine. Lack of uniformity in chips is caused by any of the following: improper setting of knives; dull knives; poor adjustment of end thrust bearings; incorrect speed of disc; worn disc; worn face plates or guard angles; worn bed knife, or improperly set bed knife; intermittent feeding of wood; and jumping of short ends in spout.

The Manufacture of Paper Pulp from Bordeaux Pine (Pinus Maritimus)

R. MICHEL-JAFFARD

(Abridged translation prepared by A. Papineau-Couture from *"Le Papier,"* XXVI, 77-84, 197-202, 321-329, 571-575, 929-935, 1077-1080, 1187-1195 (1923); XXVII, 213-219 (1924)

(Continued from July number)

Sulphate Cooks

THE sulphate process differs from the soda process only in method of making up the loss of alkali which occurs during recovery. It is practically an application to the pulp industry of the principle of the Leblanc soda process, with a view to using a cheaper material. It consists in adding sodium sulphate, either to the fresh liquor or to the concentrated black liquor. During smelting the organic matter reduces the sulphate to sulphide, just as in the Leblanc soda furnaces. But in this case no calcium carbonate is added and the sulphide is not converted into carbonate, so that it is only partially causticized by the lime.

It might seem at first sight as though this sodium sulphide was only a troublesome impurity; but it really has a certain cooking action, and moreover it greatly improves the results in some manner that has not yet been clearly determined, but which seems to depend on its reducing properties which protect the cellulose from oxidation and result in larger yields.

There would be no object in trying to reproduce on a laboratory scale the various stages in the preparation of the liquor. The sulphide is the characteristic reagent of this process; and all that is required is to add it in suitable proportions in the alkaline liquor. This is what we did, taking as a starting point the work done at the Forest Products Laboratory at Madison and the data which we found in the literature.

As in the case of the soda cooks, we began with proportions suitable for the production of Kraft pulp, and we gradually increased them in accordance with the results obtained in the soda experiments. As in the latter case we cooked at 7 kilos, except in one case where we used only 6 kilos.

Our results in these tests lead to the following conclusions:

1—As with soda pulp, the ease of bleaching increases with the concentration of the liquor, and especially with the excess of alkali.

2—The optimum amount of alkali (caustic soda and sodium sulphide) is about 30 per cent; and increasing the amount above this figure seems to have a relatively small effect on the ease of bleaching.

3—Less time is required to obtain an easy bleaching pulp than in the case of soda pulp.

4—The yield decreases as the severity of the treatment (excess of alkali, concentration of the liquor, pressure, time of cooking) increases; but for equal bleaching qualities it is slightly greater than by the soda process.

5—By using suitable excess and concentration of alkali, equal or slightly better whiteness is obtained with the same chlorine consumption by the sulphate process.

6—The unbleached pulps are very pure celluloses, which are partially degraded by bleaching with decrease in the alpha-cellulose content.

7—Best results were obtained by cooking for four and a half hours at 7 kilos with 23 per cent of caustic soda and 7 per cent of sodium sulphide in the form of a liquor having a concentration of 6 per cent of the two reagents together. Under these conditions the consumption of alkali (calculated as caustic soda) is about 16 per cent and the yield 39 per cent. A creamy white, suitable for use in most cases, was obtained with slightly less than 5 per cent of available chlorine.

The results of these two series of tests clearly prove that the ordinary sulphate and soda processes are quite applicable to the treatment of Bordeaux pine for the production of easy bleaching pulp suitable for the manufacture of the usual grades of paper. The color of the bleached pulp was a creamy white, such as is so frequently obtained with esparto pulp; but we have every reason to believe that a better color would be obtained in commercial operations.

In the case of the wood from untapped trees at

any rate, the consumption of chemicals and the yields of pulp are of the same order of magnitude as in the production of soda pulp from other woods; and the sulphate process gives slightly better yields than the soda process, with at least as good bleaching properties.

It goes without saying that the resins are completely eliminated in the form of soaps, and that there is not the least trouble to fear on that score. And finally, the unbleached pulp is very pure and has a high cellulose content (though naturally not as high as cotton); but bleaching degrades it to a certain extent.

Kraft Pulps

Kraft pulps are undercooked and incompletely delignified pulps, which cannot be bleached by the usual process, but which give exceptionally fine wrapping papers which are very strong and flexible, much more so than the ordinary grades of wrapping papers. It is manufactured exclusively by the alkaline processes, and nearly always by the sulphate process. Scotch pine is the species most generally used for preparing this pulp.

Krafts have frequently been considered as semi-chemical pulps, holding a place intermediate between groundwood and chemical pulps, which would put them in a class similar to "brown" groundwood. This is hardly correct. Though they are more lignified than easy bleaching sulphite, soda or sulphate pulps, they are incomparably less lignified than semi-chemical pulps. They are more in the class of the strong hard sulphites, which are very difficult to bleach, and which are also used for the manufacture of very strong papers. But the latter are harsher, and do not possess the same flexibility as the Krafts. Kraft yields are higher than those of easy bleaching soda or sulphate, and are of the same order of magnitude as the yields of extra strong sulphites.

The only difference in treatment in the production of easy bleaching soda and sulphate and of Kraft lies in the fact that the treatment is less severe for the latter case. The three chief factors which can be adjusted for this are pressure, concentration and time, the latter two being the ones most generally used, and especially the time of cooking. They are thus prepared by cooking a very short time with slightly weaker liquor, which is nearly always obtained by addition of suitable amount of black liquor. This practice leads to a characteristic brown-colored pulp, which is much sought after, to such a point that others are sometimes added to strengthen the natural color.

But the special cooking conditions are not the only important factor in the production of Kraft; it must also be subjected to an appropriate mechanical treatment. The undercooked chips are rather hard to be put through the usual types of breakers, which moreover have the drawback of cutting the fibers very easily; so that kollergangs are generally used because they preserve the full length and strength of the fibers. And, just as in the case of other strong pulps such as extra hard sulphite or manila, in order to obtain maximum strength it is necessary to give a fairly long beating treatment, which, however, should not exceed a certain time which gives optimum results.

We carried out our experimental cooks in the manner already described and in the same autoclave as for the easy bleaching pulps. The washed pulp was then worked in a small 17 liter beater, and samples were taken at intervals to determine the tensile strength and the freeness by the Schopper method. A very simple home-made apparatus was used for the purpose, consisting essentially of a funnel, to which was fused a side tube at the top of the stem, while a drawn-out glass tube was connected to the end of the stem by means of a short length of rubber tubing. A bronze sieve covered with a piece of machine wire was placed on the funnel.

Five hundred cubic centimeters of the pulp at a consistency of exactly 0.6 per cent as well stirred and rapidly poured on the sieve, and the volume of water "V" which flowed through the side tube was measured. Then, $D = \frac{500 = V}{500} \times 100$ represents the "absolute freeness." Let "D_o" be the freeness before heating, and "D_t" the freeness after time "t," then $\frac{D_t - D_o}{D_o} \times 100 = \frac{V_o - V_t}{V^o} \times 100$, gives a measure of the work done during beating.

During our experiments we tried out various methods of beating, endeavoring to obtain a product having a breaking length comparable to that of Swedish Krafts. At the start we used either bronze tackle or basalt roll and bedplate. The strength obtained by means of the stone was much higher than that with the bronze, which was caused by hydration which in certain cases was so great as to give practically a greaseproof sheet. In the latter tests we gave a good brush with bronze roll and bedplate.

At first we prepared the sheets either by pouring the pulp onto the mould, or by dipping the mould into the stock. Subsequently, we followed the suggestion of Blasweiler and formed the sheets by dipping the mould several times in the stock, turning the mould each time. This gives greater uniformtiy in thickness and in the results of the tensile strength tests, which, though not identical with those given by machine made papers, approximate fairly closely to the latter.

The breaking length was determined with a Schopper tensile strength tester.

We also tested the flexibility of the stock as follows: A strip of the same size as was used for the tensile strength test was carefully folded on itself

and creased by rolling a 100 kilo weight over it. It was then given 120 double folds and tested in a

Brushing two hours with bronze tackle.

The yield was 47 per cent.

5—Even when the strength was no greater than that of strong sulphites, the pulp was far more flexible than the sulphite.

6—The yields varied quite appreciably in the different tests; but this seems to have been due to differences in the wood rather than in the treatment, as there seems to be no relationship between the severity of the treatment and the yield. In many cases the yields obtained were comparable to those obtained by the sulphite process, which also holds in the manufacture of Kraft.

As in previous tests, the most resinous parts of tapped wood gave a low yield, which is quite natural. No conclusions can be drawn from the results of the strength tests, because this cook was given a most unfavorable mechanical treatment.

We can sum up these results by saying that Kraft pulp can be obtained from Bordeaux pine which will be comparable with the best Swedish Krafts, by using a similar treatment which will give approximately the same yield. It is probable that working on a large scale would give better results than our laboratory tests, for the simple reason that the pulp could be ground in a kollergang. According to one of Schwalbe's recent articles ("Papierfabrikant," June 9, 1923, No. 22A, p. 60) at least partial re-use of the black liquor would improve the strength on account of the resins which it contains.

Chlorination Tests

We do not propose to go into a detailed description of the chlorine processes, which are based on Cross and Bevan's work. Numerous interesting articles have been published within the last two or three years describing the de Vains process and the Cataldi-Pomilio processes, both of which have passed the laboratory stage and are being worked commercially.

These processes comprise essentially the following three stages:

1—A preliminary treatment, which has always been alkaline so far, to remove resins and fats, part of the pectic matter, and even some lignin, and to render the material more permeable to the chlorine. The severity of this treatment varies considerably in different processes, and it can be either a mere impregnation or regular digestion under pressure.

2—Treatment with chlorine, either as a gas (Cataldi-Pomilio) or as chlorine water (de Vains), which acts principally on the lignin according to the equation: $RH + Cl_2 = RCl + HCl$. But Cross and Bevan observed that with practically all fibers except jute there also occurs an oxidation which can be represented by the equation: $RH + Cl_2 + H_2O = ROH + 2HCl$. So that of four atoms of chlorine reacting, three are converted into hydrochloric, and only one combines with an organic radical.

3—An alkaline treatment, having a twofold object:

a—Neutralize the hydrochloric acid formed.

b—Dissolve the chlorinated lignin derivatives, which are insoluble in the free state, but are soluble when the acid functions are neutralized with soda. The equations representing these reactions can be written: $RCl + 2NaOH = RONa + NaCl + H_2O$ and $RCl + Na_2CO_3 = RONa + NaCl + CO_2$.

We have not yet been able to make a systematic investigation of the application of these chlorine processes to Bordeaux pine; but after observing that Swedish Krafts could be bleached to a beautiful white by treatment with chlorine water, we tried the process on the strongest sulphate Kraft that we had obtained in the course of our tests, and the results were most gratifying.

We carried out the treatment without any special apparatus, and along the same lines as the bleaching tests already described, merely allowing the pulp to stand in contact with chlorine water of known strength in covered jars, at room temperature, until all the chlorine had been consumed. A sufficient amount was taken to obtain a golden yellow pulp. When absorption was complete the hydrochloric acid formed was neutralized with caustic soda and the pulp was washed. An additional quantity of soda was then added, equivalent to half the chlorine absorbed, and allowed to stand at room temperature for at least two hours. The pulp was then washed to eliminate the dark brown alkaline liquor and was finally bleached in the manner already described at the beginning of this article.

A first chlorination with 5 per cent of chlorine gave a much better white than we were able to get by bleaching the easiest bleaching sulphate pulps. But it required an even stronger treatment to obtain the snow white that we were aiming at. Comparative tests were carried out with the usual bleaching process as applied to easy bleaching sulphate, and with the chlorination process applied to sulphate Kraft; and they brought out the following points:

1—With an equal total consumption of caustic soda and chlorine, the chlorination of Kraft gives a higher yield and a better white.

2—With a slightly increased consumption of chemicals, chlorination of Kraft gave us a color which was much superior to what we obtained with ordinary sulphate pulps by means of chloride of lime and which would have required a very much greater consumption of chemicals, if indeed it could have been obtained at all, by the latter process. As to the yields, they were but slightly lower.

3—As the chlorination treatment is more drastic, the increased whiteness is obtained by sacrificing the alpha-cellulose content; but nevertheless the strength remains high.

4—If spent liquor could be used for neutralizing

and dissolving the compounds formed during chlorination, the consumption of chemicals would be lower than by the ordinary bleaching process with chloride of lime, even when chlorinating to maximum whiteness. But before doing this it would be necessary to make sure that the resins reprecipitated during neutralization would be redissolved by the excess of soda or would be eliminated during washing.

These few results bring out quite clearly the advantage of chlorinating Kraft over the usual bleaching of soda or sulphate pulp, and the superiority of the process would be still further increased if spent liquor could be used in neutralization. But it also has a further advantage, namely, that the same stock could be used for two entirely different purposes according to market requirements, either as extra strong and flexible pulp, or else as very high grade bleached pulp.

Sulphite Tests

This process is particularly well suited to the treatment of many conifers on account of its cheapness, high yield and strong pulp, which can be used for both coarse and fine papers. A few years ago a mill was started up in the Landes for the manufacture of sulphite from Bordeaux pine; but it had to shut down in a short time. In America it is not used for such resinous woods as longleaf pine; but it is used to an appreciable extent for the manufacture of news grade sulphite from Jack pine, which is in many ways similar to Scotch pine. It must be admitted, however, that this tree is no more resinous than spruce or balsam.

Though we did not have the time to make a systematic study of the application of the process to the treatment of Bordeaux pine and did not possess an experimental digester suitable for this kind of cook, we did not want to neglect the process entirely. We therefore put some chips prepared in the laboratory in a perforated lead box and placed the latter in the regular sulphite digesters during cooking. We were thus able to study the action of the process, both with and without preliminary treatment with caustic soda.

Treatment with Sulphite Only

Only two tests were made.

The first one was carried out under the conditions regularly used at the Lancey mill of the Papeteries de France for the production of sulphite from balsam. The sapwood was well cooked; while the heartwood, which is no more resinous but much harder, remained uncooked. This test showed up particularly well the difference between the two portions of the wood.

The second test was carried out under the conditions used for the treatment of Scotch pine, and conditions were more severe, cooking lasting twenty hours at a maximum pressure of 5 kilos. This time the heartwood was as well cooked as the sapwood.

With a sufficiently drastic treatment it would doubtless be possible to cook Bordeaux pine just as readily as Scotch pine. High pressures and strong liquors, such as are used in America would probably accomplish the desired result, though at the cost of some of the strength. The chief difficulties with the process are not encountered in the pulping but in running the stock on the paper machine, owing to the pitch which sticks to the wire and makes rosin spots on the paper. This trouble is present when using pulp from Scotch pine (it is also one of chief objections of paper makers to the use of Jack pine in this country—Trans.), it would evidently be much worse with the more resinous Bordeaux pine. The preliminary steaming which is claimed in many patents for the extraction of the turpentine and of some of the resins, helps to overcome this, and the use of high pressures in cooking might also improve matters. This is a difficult field; but a lot of useful work could doubtless be done along these lines.

Preliminary Soda Treatment

The purpose of the preliminary soda treatment was twofold:

1—Facilitate the sulphite cooking.

2—Overcome the pitch trouble inherent to the use of a pulp with an excessive resin content.

The soda treatment was carried out in the experimental digester in the usual manner, and after washing the chips were put in the perforated lead box and placed in the sulphite digester where they were cooked under the conditions regularly used for the production of easy bleaching sulphite.

In the first test we used 2 per cent of caustic soda at a concentration of 0.4 per cent and cooked for four hours at four kilos. In the second case we used 8 per cent of soda at a concentration of 1.8 per cent and cooked for four hours at two kilos. In neither case did the sulphite treatment cook the wood, despite the fact that the commercial balsam pulp produced at the same time was of excellent quality. The results were much worse than with the straight sulphite treatment.

This is rather surprising at first sight, but it is probably due to the fact that the soda treatment rendered the wood impermeable so that the sulphite liquor could not penetrate. Schwalbe has observed the same phenomenon in the case of wood which had been treated for the extraction of the resins, either with solvent or with fairly strong alkaline liquor; but he claims that the use of a dilute liquor containing 0.4 per cent or less of caustic soda not only removes the resins in a satisfactory manner but even facilitates the action of the sulphite liquor. This conclusion is not in accordance with the results of our first test, presumably because Schwalbe did not cook under pressure.

We were unable to push our investigation far enough to be able to judge whether the sulphite treat-

ment would be more economical and advantageous than the alkaline processes. It is worth noting, however, that sulphite pulps are the only ones which can be converted into imitation parchment without special chemical treatment.

Uses of the Pulps

The pulps obtained by chlorination after alkaline cooking could be used in the manufacture of fine papers wherever high grade chemical wood pulps are used at present, while those bleached with chloride of lime could be used in writing papers, where a creamy white is sometimes preferred to a snow white.

The unbleached pulp could be used for making posters, and similar grades, and also strong boards. The Kraft pulps could be used for the manufacture of exceptionally strong and flexible wrapping paper, equal to those made from Swedish Krafts. If further work confirms our opinion as regards the feasibility of manufacturing sulphite from Bordeaux pine, it could be used for the production of imitation parchment; otherwise, this could perhaps be done by suitable chemical treatment of the soda pulps, along the lines of some of Schwalbe's recent patents. Low grade papers which are largely made from groundwood could evidently not use any great amount of Bordeaux pine.

The manufacture of plastics, artificial silk and cellulosic explosives requires an exceptionally pure cellulose, and for this reason cotton is used almost exclusively, except in the manufacture of viscose, in which soda pulp is used. During the war, however, considerable work was done, especially in Germany and also in America, on the manufacture of cellulose ethers from wood pulps, and processes were perfected for the purification of sulphite and soda which was to be used in the production of nitrocellulose. These had actually been applied in Germany and were about to be used in the United States when the war came to an end. Should conditions arise which would warrant their application, there is no doubt that Bordeaux pine pulp could be used for this purpose just as well as soda made from other pines or sulphite from spruce and balsam. And naturally it could also be used in the manufacture of celluloid and of Chardonnet silk, and probably also for the production of cellulose acetate and of cuprammonium silk.

Utilization of By-Products

Of course one of the most rational and most efficient methods of reducing the cost of production of a given product is to work up by-products which can be either used locally or otherwise disposed of to advantage. A complete discussion of the utilization of the 50 per cent or so of material which is being wasted at present in the manufacture of pulp would take us too far afield; and we shall deal only with the non-cellulosic matter which is characteristic of Bordeaux pine, namely, resin and spirits of turpentine.

For these tests we used the same tapped wood that was used for a few of the pulping experiments; but in the course of our work we observed that the resin content was most variable, and at no great distance from the tap hole it fell to 7 or 8 per cent, which is practically the same as in the untapped wood. These are about the percentages which should be considered in studying our results.

We started out by following the indications given in J. S. Bates' thesis at the University of Columbia in 1914. We were unable to obtain any satisfactory results under these conditions, and we later discovered that the cause of our failure lay in the irregularity in the resin content which we have just mentioned. We then decided the best course would be to start over again the study of the extraction of resin by means of alkaline solutions and its separation from the liquors. So far we have barely begun this work, and the results which we are about to describe should be regarded more as indications of the lines to be followed than anything else.

Optimum Conditions for Alkaline Treatment

Tests were carried out by boiling in open vessels at atmospheric pressure, making up losses due to evaporation by addition of water, and also by cooking under pressure, relieving the pressure in some of the tests to recover the turpentine. (The conditions and results of the tests are given in two long tables and commented at some length; but the conclusions are sufficiently explicit to permit of the omission of the tables.—Trans.)

1—There is an optimum time of extraction, which does not give complete extraction of the resins, but beyond which the additional amount of resin obtained is too small to be economical. When boiling at atmospheric pressure with 300 per cent of caustic soda on the weight of the wood, as a 4 per cent liquor, this optimum time is about 12 hours.

2—High percentage of soda and strong liquor greatly increase the rate of extraction.

3—Treatment under pressure does not seem advantageous, as the resin is apparently attacked, especially with high pressures.

Of course these apply merely to the removal of the resins from the wood, and not to their recovery from the alkaline liquor. A large amount of soda and a strong liquor cause an appreciable delignification of the wood, and consequently the resin soap solution contains a large amount of impurities which make the utilization or the separation of the resin very difficult. Moreover, Schwalbe, who has gone pretty thoroughly into this question, has observed that preliminary extraction of the resins with too concentrated a solution of soda causes a decrease in the yield

of soda pulp, and completely prevents cooking by the sulphite process. This latter observation is in keeping with our experience, as we have already mentioned in connection with our sulphite tests.

According to Schwalbe an exceptionally mild alkaline treatment should be used for removing the resins, such as he describes in his German patents 363,666 and 363,667. To obtain a soap solution free from humic compounds the temperature should not exceed 65° C, and the strength of the liquor should not be greater than 0.5 per cent. Under these conditions the wood does not swell, washes easily, and can be readily cooked by either the soda or the sulphite process. The extraction is accelerated by active circulation, and preferably also by exerting hydraulic pressure to facilitate penetration. Addition of saponin or of Turkey red oil also facilitates the solvent action of the liquor by the formation of foam. The liquor is used from two to four times, and is then acidified to remove the resins. As oxygen has a tendency to render the resin insoluble, he overcomes this tendency by using reducing agents such as sulphites or hyposulphites, and by avoiding all contact with air as far as possible.

Separation of Resins from Liquor

The alkaline liquor thus obtained is evidently a dilute solution of rosin soap, which we should theoretically be able to use for sizing paper; but on account of its dark color it could be used only for cheap brown papers. On the other hand, use of the rosin soap as soap, would require an expensive concentration, as the soap content of the liquor is quite low. We therefore investigated the possibility of precipitating out the resin by some chemical process, but had to content ourselves with a few experiments without going very deeply into the matter.

We tried successively the action of dilute sulphuric acid, carbonic acid, both free and in the form of bicarbonate, and lime and magnesia, both separately and together. The precipitate was filtered, washed, treated with acid if necessary, extracted with ether in the presence of water, and the separated ether solution, was evaporated, and the resin was weighed. Our results brought out the following points:

1—Maximum recovery of resin is obtained with sulphuric acid; but the cost would be prohibitive as the whole of the acid would be lost.

2—Carbonic acid, whether free or in the form of bicarbonate, does not cause appreciable precipitation of the resin. The precipitate formed probably consists of lignin and hemicelluloses which are dissolved out along with the resin.

3—Lime and magnesia do not cause complete precipitation of the resin, at least not under the conditions which we adopted; but they precipitate a considerable portion of it, especially magnesia, when added to the hot solution. As the precipitant combines with the precipitated rosin and most of the excess is insoluble, it could be recovered without any great difficulty. If the recovered rosin were destructively distilled for the production of rosin oil, the lime or the magnesia would be found in the residue from the distillation. It seems to us that there would be some interesting work to do in this direction.

When such a recovery process has been properly worked out for application on a commercial scale, it will constitute a valuable addition to the treatment of Bordeaux pine, and of all highly resinous pines in general. But when we consider the amount of resin which is normally present in the tree, which should not be confused with the resin content of trees used for the production of naval stores, it is easily seen what a big mistake it is to attempt to recover the resin as the main product, leaving the pulp as a by-product, or even neglecting it altogether, as some investigators have tried to do.

Rinman Process

In closing we shall briefly refer to the Rinman process, which consists essentially in a mild cooking treatment in the presence of mercury as catalyzer, and dry distillation of the concentrated black liquor in presence of lime and of soda in a special furnace. We have not studied this process personally; but large scale tests have been carried out on Bordeaux pine, and the following results have been communicated to us privately:

Products recovered per ton of Kraft pulp:

Pure methyl hydrate	30 kilos
Pure acetone	18 kilos
Pure methyl ethyl ketone	17 kilos
Acetone oil and light oils	20 kilos
Heavy oil	40 kilos

Products recovered per ton of easy bleaching pulp:

Pure methyl alcohol	43 kilos
Pure acetone	29 kilos
Pure methyl ethyl ketone	20 kilos
Acetone oil	18 kilos
Light and heavy oils	75 kilos

The yields of Kraft and of easy bleaching pulp are exceptionally high, and the quality is fully equal to that of the very best of the corresponding pulps prepared by the sulphate process.

New Ideas

Next to character, a new idea is the most valuable thing in the world. A new idea is something that anyone, rich or poor, young or old, can get. Every progressive employer will cheerfully pay for a new idea. The best way to get an increase in salary is to bring your employer a new idea. New ideas are the only things that have made money for me; new ideas are what every one makes money with. I have yet to hear of a person who carried a good new idea to his or her employer and did not get rewarded for it.

—Roger W. Babson.

Pointers for the Engineer

By W. F. SCHAPHORST, M. E.

Accidents

THE poster now on display by railroads all over the United States, "Wait, You May Lose," is applicable also to paper mill power plants. While writing this, I am in a small city in the mid-West where two engineers are in bed suffering from injuries because they didn't wait a few days before doing an unimportant job. A brick hot well had been built. It contained about three feet of hot water. The chief engineer and his assistant were on top putting on the manhole cover when suddenly the green unset mortar gave way under their combined weight and the weight of the arched brick top. Fortunately, the brick went down first and served to save them from scalding to death. They are now recovering. Instead of a brick top, a reinforced concrete slab is being installed this time.

Prony Brakes

YEARS ago the writer was given to understand by his college professor, and he thoroughly believed, that the prony brake method of testing a steam or gas engine, or even an electric motor, was "absolutely accurate." However, experience with such brakes has taught me that they have many faults, some of which may be enumerated to advantage.

In the first place, it is impossible to make a prony brake apparatus too accurate or of too high grade. All measurements should be of "hair breadth accuracy," as they say, because little errors made in measuring lever arms, or in measuring pressures on scales may amount to a great deal before the test is ended.

Small sizes of engines, up to 60 or 70 horse-power, are not so difficult to handle with a prony brake as are the larger sizes. The vibrations of the small engines are easily muffled and heat is absorbed more readily than with the larger engines. Large engines, of course, will heat a given amount of cooling water much more quickly and consequently require a quantity of water directly proportional to the horse-power output.

The brake arm should be perfectly balanced before the test, if possible, and there should be little or no moving of the brake arm during the test. The less moving and vibration the better. In other words it should "ride" well. If the brake arm wavers at all it is impossible to make an absolutely accurate reading of the scale.

Make sure that the water-catching device does not rub on the pulley, or absorb energy in any way.

If the cooling water is poured into the inside of the rim of the flywheel it should be given the same velocity as the peripheral velocity of the flywheel rim, and it should move in the same direction as the flywheel rim so that no energy will be absorbed by or taken from the flywheel during the process of cooling. It is equally important that no energy be imparted to or taken from the flywheel if the cooling water is removed by mechanical means. Sometimes the water is permitted to evaporate from the brake in the form of steam, which is a better method in that it eliminates the above mentioned possible mechanical errors.

As already stated, the length of arm must be very accurately measured and if unbalanced it must be accurately weighed before beginning the test. After the beam is weighed no additions or subtractions of any kind should be made without reweighing. It is well to check over the weights, blocks, etc., between tests, so as to be certain that no change has been thoughtlessly made without making corresponding corrections on the test sheets.

Sometimes blocks of wood or metal and other objects are placed on the scale to assist in shimming up and weighing the end of the brake beam. All of these accessories must be carefully weighed before making the test, and no more weight must be added during the test. Allowance must be made for every little item.

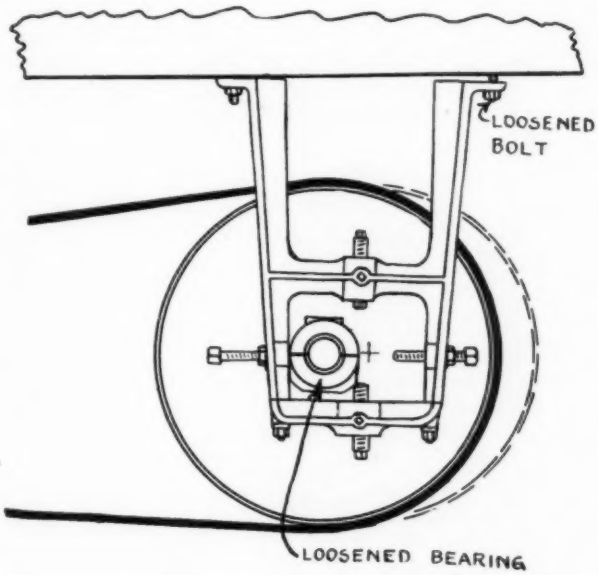
A Shaft Hanger Kink

PAPER mill belt men will doubtless agree with me that it is bad practice to run a large belt onto a pulley by first forcing one of the edges to catch and then running the belt on either by hand or by power. It is well known that this is liable to cause the belt to stretch more on one side than on the other. The belt is thereby permanently injured. This holds true for belts of all kinds.

To avoid this condition, we are often glibly told to make leather belts endless while they are on the pulleys by means of belt clamps, etc., but that method may not always be practical and sometimes it is impossible, particularly if the belt has already been made endless by the manufacturers, as is often the case.

Where conditions allow it, a good kink for putting large belts onto the pulleys so as not to injure them is to loosen the adjusting screws on the hangers as shown in the sketch herewith. This permits the shaft to move over a considerable distance, temporarily shortening the distance between shaft centers. Sometimes the shaft may be moved inward two inches or even more, thus making it possible to put the belt on easily. Shortening the center distance

two inches virtually adds four inches to the belt's length. Also, to further assist, one of the hanger bolts for bolting the hanger to the overhead beam may be loosened so as to allow the hanger to swing inward still more. Where patented overhead beams are employed, it is sometimes possible to slide the entire hanger forward without touching the adjusting screws. All of these methods are possible,



yet they are seldom used because they are not thought of. The writer has never seen one of them mentioned in print in any magazine or book.

Then, after the belt is on the pulleys, bring the hanger back to its normal position. This is a simple thing to do by turning the nuts where the first and second methods mentioned above are employed. The original position of the hanger should always be marked before moving to avoid tedious realigning. Turn the bearing adjusting screws back to their original positions. These positions are easily found because the screw on the opposite side and the top screw need not be moved at all as indicated in the sketch.

In the sketch, which is drawn slightly exaggerated to emphasize these points, the cross lines indicate where the center of the shaft will be after the beam bolt is retightened and after the adjusting screws are back to their original positions. The dotted curved lines show where the pulley rim will be after everything is retightened and back to normal.

To be sure, this method is not always practical where there are belts running in both directions as on a common line shaft, but where it can be employed it is well worth while. It is a quick and simple method and the saving effected in large, expensive belts surely makes it worth remembering and putting into practice.

Bearings Made of Rubber

SOME paper mill operatives may not know that rubber is now coming into use to replace babbitt metal and Lignum Vitae. Engineers have already gone so far in the use of rubber as to replace the babbitted stern bearings on a Diesel power tug with rubber. After having been used ten months, it has shown no sign of wear either on the shaft or the bearing. Some of the leading pump manufacturers have already adopted rubber bearings as standard equipment for their pumps.

Surprising as it may seem, the coefficient of friction of steel on wet rubber is even less than on an oiled babbitt surface, and it is reported that rubber will carry loads as high as 375 pounds per square inch.

The principal advantage of rubber is that sand or grit will not cut the bearing, nor will it cut the shaft because the sand embeds itself into the rubber and in due time works out without doing any cutting or scratching.

Oil, of course, must not be used for lubricating as it would ruin the rubber. Water only is the lubricant. This may amount to a considerable saving in lubricant and money.

The rubber bearing is provided with a spiral groove similar to babbitted and other bearings. A constant stream of water passing through this groove carries out any dirt or grit that may become embedded in the rubber and which is generally rolled out into the groove.

Speeds as high as 5,000 R.P.M. are reported with bearings of this type.

Vibration, noises, pounding, misalignment, etc., are defects that are entirely or partially rectified by means of rubber bearings.

The progress being made by this new type of bearing will doubtless be watched with interest by all readers of THE PAPER INDUSTRY.

The writer considers it a very important engineering advance.

Super-Power

IN THE June number of THE PAPER INDUSTRY was an excellent article by Arthur S. Wells, entitled "Super-Power and the Paper Mill," on which the editor calls for comments. I agree thoroughly with Mr. Wells. There is no question in this writer's mind but that it will be many years before a method will be devised whereby the average paper mill will be enabled to use power from super-central stations more economically than from the smaller isolated independently owned steam plant. If you missed the above-mentioned article by Mr. Wells, it is worth getting and reading.

Our idea of a "good mixer" is a beater engineer.

Operating Soot Blowers

A POINT that is oftentimes overlooked by the average paper mill engineer is that when using mechanical soot blowers it is not necessary to turn the steam on so long on later passes of boilers as on the first passes. Much valuable steam can be saved by proportioning the amount of steam almost directly with the amount of heat absorbed by the tubes in the various passes. The first rows of tubes with which the gases and radiant heat come in contact do most of the heat absorbing and therefore they should have more attention than the tubes in the last passes which do much less absorbing.

If it is impractical to clean the last passes more quickly than the first passes because of the mechanical construction of the blower, it may be better to omit operating the blower in the last passes every time some blowing is done. It is better to confine one's efforts to cleaning the first passes. Thus the last passes may be blown once a day or even once a week, depending upon the kind of fuel, the overload, etc. At the same time it might be well to clean the first pass twice a day or even more frequently.

An excellent rule for determining the amount of steam used by a soot blower is this: To the gauge pressure in pound per sq. in. add 14.7; then multiply by the total area of all of the openings in the soot blower element in sq. in.; and lastly divide by 70. The result is the number of pounds of steam used per second. By applying this rule to the various elements installed on the boilers, it is a simple matter to determine the annual saving that can be effected as a result of timing operations and saving steam. Steam is becoming more and more valuable as time advances and we can no longer afford to waste it.

Captive Fungus Shows Speed in Rotting Wood

In less than nine months from the time when a tiny piece of fungus was placed on the block of spruce in this jar at the Forest Products Laboratory, the destroying threads of the fungus had seriously rotted the wood throughout the block and produced the toadstool with its billions of decay-spreading spores. In other conditions the same fungus might show even more rapid destruction of wood.

Wood which is kept thoroughly wet or absolutely dry will not decay. Decay can be combated by storage methods and types of construction which keep the wood dry, by keeping the wood free from contact with soil, weeds and debris, by keeping it thoroughly wet, or by the use of chemical preservatives.

An amount of wood equal to two-thirds of our annual forest growth is destroyed by decay in service every year.

Waterproof papers are tested at the Bureau of Standards by the use of a piece of ground glass similar to that used in the back of a camera. The paper is folded into the shape of a small box, and is filled with water after being placed on the glass. The glass rests on a dark surface, such as black paper, and has the ground side uppermost. If moisture

goes through the paper it makes that part of the glass transparent, and when the box is lifted the damp section shows dark in contrast with the ground surface of the glass.

A Prayer

O Lord, deliver me i pray, from berds that feel that they was ment, to do the grate big things in life —to be the dollar not the cent. the fellows who are appt to feel that jobs whitch they shoid ott to do are far beneath there mitey class, & pass the bukk, to me, & you. but give me, Lord, the gi who thinks he ain't too good to do his part, & bukkels into every job —& does his best, with all his hart. the praktiss that this berd will get in doing things that may be small, will make him reddy for the job that the uther berd cant tutch at all.—Rolfe C. Spinning.

Back of the Block Pile

By B. F. AVERY
Forester, Spanish River Pulp and Paper Mills, Ltd.

TO PAPER mill operatives, occupied with problems of quality and production, the wood supply may be a matter of little concern. The block pile grows and diminishes periodically, but there is always wood in the pile. Sufficient unto the day is the evil thereof, and why take thought of the source of block piles?

But the thought is an important one and the sooner that all in the industry look beyond the block pile the better for the industry. A few years ago the view beyond the block pile was obstructed by trees, but the saw and the axe have been filling block piles with those trees, and now the view is much less obstructed. In fact, one has to look rather closely in some parts of the country where forests once abounded, to see a tree at all. The imagination may picture miles upon miles of potential block piles beyond the horizon, but climb to the skyline and look, then climb again and look and be disillusioned. The forests have disappeared.

Somewhere, of course, there must be pulpwood forests, for back of the mill there is still a block pile. Where are the forests, and how long will they last?

Take a look at the wood in the pile. Most of it is spruce. The mills demand it. Most of it is sound. The mills demand it. About one hundred and eighty of the two-foot blocks make a cord. For every two hundred and twenty-five two-foot spruce blocks, deduct an acre from the forest that was somewhere last year. A cord and a quarter of sound spruce pulpwood is the average yield of millions of acres that are the source of block piles. How many square miles of forests are piled between the slasher and the mill? Figure it out. This year and next year, for every cord and a quarter of sound spruce pulpwood that the mill receives, another acre can be "written off." But the acre that the wood is cut from is not barren yet, neither has it yielded all the available pulpwood that it has grown. In addition to the sound spruce pulpwood, the average acre has something more to give if the mills will take it. There is a half a cord of sound balsam and three quarters of a cord of sound jack pine, besides the birch and poplar. There is also a cord and a quarter of partially sound spruce, balsam and jack pine that will yield good returns in pulp if the mills will take it. There is then in addition to the cord and a quarter of sound spruce, two and a half cords of less desirable pulpwood on this acre, that we must leave, if not to burn, at least to seed in the cut-over area with less desirable species, unless the mills will authorize its delivery.

Do we realize what the utilization of the other two and a half cords on the average acre would mean? It would mean that the area from which the block pile came would furnish wood for the pile for almost two years more. The limited forest behind the mills would be productive three times as long as similar forests have been in the past. These additional years will give time for woods management to work out plans for permanent wood production, and this improved utilization will create conditions favorable to the success of such plans.

Think it over. Has the paper industry any spirit as an industry? It has. Does the sustained life of the industry mean something to us who are a part of it to-day? It does. Then when the block pile shows one hundred percent spruce, let us ask for the rest of the wood that grew where that wood came from. When the block pile contains a percent of less desirable wood than sound spruce, let us make the best paper possible in the knowledge that the life of the industry is the reward for the effort.

Beyond the block pile is the foundation of the paper industry. The forest foundation will submit to slaughter or it will grow strong with renewed youth in accordance with the attitude of the industry toward it. If the industry lives, it will live because all of its members, mill operators as well as woods operators, act now to sustain its foundation.

The Healthy Guy

There was a strong and healthy guy who thought that he would never die. Though all around him others croaked, into his bean it never soaked that he was made of mortal clay, and doubtless would cash in some day. And when anon with good intent a life insurance agent went to urge him to protect his wife with some insurance on his life, lest she be forced to souse the suds to keep herself and kids in duds, the healthy guy got mighty sore and pawed the earth and swore and swore. He vowed that he was free from ills and didn't know the taste of pills; he knew he'd live to be fourscore, and possibly a little more, and in that time how could he fail to salt the necessary kale to put him safe beneath the sod and leave his heirs a goodly wad? And with dire threats of deadly harm he drove the agent off the farm.

Now that guy with the healthy liver went out next morn and cranked his flivver; gaily he threw her into high and down the dusty pike did fly. A wheel rolled off, there was a wreck that broke the healthy geezer's neck. And now his wife toils o'er the tub to buy herself and kids some grub; all because the healthy guy thought he was never going to die.—Stolen.

Editorial Comment

By WILLIAM SIBLEY

Killing the Goose That Laid the Golden Egg

THE Wisconsin Manufacturers' Association recently issued a Bulletin entitled: "Wisconsin, Wake Up!" Because of its merit, we quote:

"The story of two Wisconsin industries now in the public eye ought to strike home to every citizen of Wisconsin.

"The Palmolive Company of Milwaukee and the Nash Motors Company of Kenosha are two of the largest manufacturing industries located in our State. They have become national institutions with over 95 per cent of their products sold outside of Wisconsin. They bring millions of dollars within our borders to be distributed for wages, materials, transportation, construction, which in turn mean purchases of food from farmers, clothing, shelter and fuel from retailers and services from professional men.

"The Palmolive Company of Milwaukee from small beginnings has attained a world market which justifies a $4,000,000 annual appropriation for advertising its products. It has established branch offices in other states and built up its home organization in Milwaukee as a Wisconsin corporation. Before the last session of the Legislature rumor was persistent that extensive additions were to be made to the home factory. What has happened?

"The general offices have been moved from the State. The Wisconsin corporation has become a branch factory. The men who, with their abilities and capital, were in a measure responsible for the success attained are no longer residents of Wisconsin. Wisconsin loses the right to address an income tax against the earnings of the non-resident officers while living, and substantial inheritance taxes when dead. Most of all, Wisconsin loses the initiative and voluntary support of public enterprises by able men who can help to make our State prosper.

"The Nash Motors Company of Kenosha is the reorganization of a corporation of average proportions by Mr. Nash and the officers of the new company who came into this State just a few years ago. By their genius and resources they have developed a remarkably successful business, the benefits of which have extended to all parts of our State.

"At present they are among the heaviest tax payers in Wisconsin. Their tax burden is several times what it would have been if located in Michigan, the home of their principal competitors.

"These men now resist the imposition of added burdens to industry in Wisconsin, calling attention to our present unfavorable laws compared with other States. For their pains, they are branded by men in political position as unpatriotic and tax dodgers.

"Mr. Nash and his business friends do not have to stay in Wisconsin. It would be mighty easy for them to follow the foot-steps of Johns-Manville, Simmons and Palmolive and make their Wisconsin plants branch offices.

"Do we want Wisconsin industries to become branch factories owned and operated by non-resident stockholders? That's the way we are headed. Let's turn around. Wisconsin—Wake Up!!"

We hope the demagogues in Washington read this that they may realize the effects of unwise legislation and excessive taxation.

Large or Small Inventories—?

WE cannot vouch for the authenticity of the report, but we have been informed that Mr. Ford is producing in excess of 200,000 cars a month. Also that he operates on an eight-day inventory. That is, he stocks supplies to meet his manufacturing requirements for only eight days in advance.

This seems impossible. It is so uncanny, we venture the assertion that the eight-day inventory covers only certain items. However, it shows wizardry at organization. If true in any respect, it proves the flivver king a manufacturing genius.

Dealers, jobbers and manufacturers in any line might well cogitate Mr. Ford's success at maintaining small inventories. One of the chief causes for a non-existent surplus is over-buying. We know retailers, and even manufacturers, who could better afford to return a portion of a consignment of goods than meet the invoice with a check. The deadly parallel of a non-existent surplus as against Mr. Ford's reputed 428 millions, teaches the moral of low stock, rapid turn-over and management. It is better to stock dollars and cents in the bank than goods on the shelves.

The Public Usually Guesses Wrong

A MAN died in Chicago recently who had amassed a fortune of nearly a half million dollars. For years he had gambled on the stock exchange. It was his habit to arrive at his office only after the day's work was well under way. He would then ask his office manager: "What is the public doing today—buying or selling?"

If the majority was buying, he would sell; if the

—— on Timely Subjects

public was selling, he would buy. His motto and guide was: "Most people usually guess wrong."

The public is mass-minded. Which explains why it is so easily stampeded. It is never difficult to mobolize a mass-minded group. Pessimism is contagious and invariably swings too far. Optimism, ditto.

During 1918 and 1919 a great deal of Iowa land changed hands at from $500 to $700 an acre—a price at which it was impossible, with all the diversified and scientific methods of farming taught at Ames, to make 6% on the investment. Today the same land can be purchased for from $150 to $200 an acre. The man with a little capital could make money on Iowa land right now—because everybody wants to sell.

When the public wants to buy—sell. When everybody wants to sell—buy. The public "usually guesses wrong."

What Freedom of Speech and Government Ownership Mean

THE per capita consumption of newsprint paper in 1920 was:

Russia	6 pounds
Japan	12 pounds
Germany	45 pounds
Great Britain	76 pounds
United States	150 pounds

Telephone conversations, per capita, were:

Great Britain	18
France	18
Germany	52
United States	160

There are two telephones for every 100 people in Great Britain. In the United States, 13.

These two comparisons tell, eloquently and exactly, the difference between free and restricted expression and between government and privately owned utilities. Unrestricted dissemination of information makes for greater knowledge and broader views, less illiteracy and greater appreciation of another's problems, as shown conclusively in the newsprint paper consumption. Private initiative is better than government operation, as evidenced by the number of 'phone calls in two countries close paralleling each other in social, political and moral ideals.

We venture the assertion that if some genii could sow broadcast over the face of Europe five million automobiles and install five million telephones, those two instruments would do more to make future wars impossible than all the Leagues and Courts and Conferences that we have ever known or ever will know.

As Walt Would Say to Skeezix, "We'll Say We Know When We're Well Off"

EUROPE, with 3,312,613 square miles of land, has 120 persons to the square mile; Asia, with 17,206,000, has 50.7 persons to the square mile; Africa, with 11,622,619 square miles of territory, has 12.3 persons to the square mile; Australia, with 3,318,000 square miles, has 4.9 inhabitants to the square mile; the Polar Regions have 5,081,935 square miles of territory with practically no population. North America, with 8,598,527 square miles of land, has a population of approximately 150,000,000, or 16.3 persons to the square mile; while South America, with 7,570,015 square miles of territory, has 7.4 persons to the square mile.

Europe has 91 persons to the square mile more than the world's average, while North America, peculiarly blessed with resources of a material nature, has 13 persons to the square mile less than the world's average.

The earth's most populated nation is Belgium, where there are 637 inhabitants to the square mile.

Stick Out Your Hand

WE quite agree with Fred Caley that the average motorist's signal code is a dangerous one. Though dangerous, it is a very simple code and not in any sense difficult to acquire. It follows:

To indicate a right turn—stick out your hand.

To indicate a left turn—stick out your hand.

To indicate that you are about to stop—stick out your hand.

To indicate that you are about to back—stick out your hand.

To emphasize your conversation with your fellow passenger—stick out your hand.

To point to a passing sign—stick out your hand.

To flick the ashes from your cigar—stick out your hand.

To determine whether or not it is raining—stick out your hand.

This is the generally accepted code. Under the circumstances, it is remarkable that accidents are not more frequent.

The New Saguenay Power Development

By W. G. MacNAUGHTON
Secretary-Treasurer, T. A. P. P. I.

ON THE Grand Discharge of the Saguenay River at Ile Maligne is being built one of the largest single power developments in Canada. The new plant will deliver more than half a million horsepower. To gain some idea of the comparative magnitude of this new addition of 540,000 horse-power, the following figures for power now developed in Canada will be of service: Nova Scotia, 23,000 H.P.; New Brunswick, 23,000 H.P.; Prince Edward Island, 300 H.P.; Quebec, 792,000 H.P.; Ontario, 1,140,000 H.P.; Manitoba, 146,000 H.P.; Saskatchewan, 45 H.P.; Alberta, 33,000 H.P.; British Columbia, 245,000 H.P.; Yukon, 12,000 H.P.; total, 2,400,000 H.P. At Niagara Falls the Canadian franchises aggregate only 700,000 horse-power. At Cedar Rapids, near Montreal, output is 192,000 H.P.; at Shawinigan, 191,500; at Grand Mere, 196,000; and at Lachine, 15,800.

The Saguenay Branch of the Engineering Institute of Canada held its summer meeting on June 6 at Ile Maligne and Kenogami as the guests of the Quebec Development Company and Price Brothers Company. I had the pleasure of attending the meeting and at the same time seeing the power development at an interesting stage of its progress. Afterwards I spent several extremely pleasant days at Kenogami, looking over the pulp and paper mills of Price Brothers Company, as well as the power developments at Lake Kenogami and Chicoutimi.

The vice-president of Quebec Development Company, Ltd., making the power development, is Sir William Price, who is a member of the Canadian Club. The president of the company is James B. Duke, who is so well known in tobacco, and who also has large power interests in Virginia.

The Price Brothers Company own a 25 per cent interest as shareholders in the Quebec Development Company and have contracted for 200,000 horse-power. This will be used in increasing the company's output of paper from its present capacity of about 400 tons per day to an ultimate figure of approximately 950 tons per day. A new mill will be built and start operating coincident with the delivery of power.

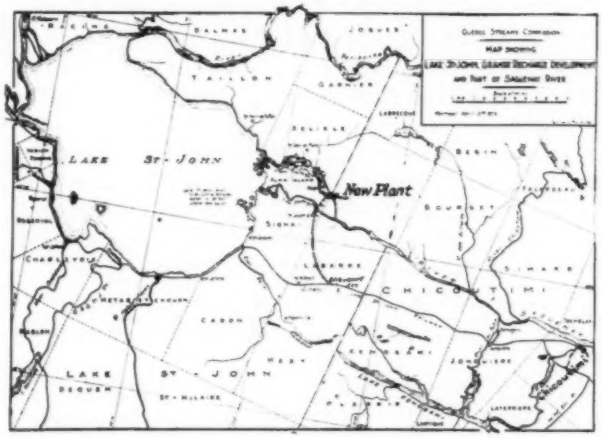
The map shows the situation of the Saguenay power development in relation to the different towns in the district and the views give a clear idea of its present state.

The dam will have a height of about 150 feet and will maintain the level of Lake St. John at somewhat over 10 feet above low water level. When it is remembered that Lake St. John is over 400 square miles in area and receives the drainage of over 30,000 square miles, its value as a storage reservoir can be appreciated.

As the bed of the river and its banks consist of hard granite the excavation is all rock work. The rock from the excavation is crushed and used for the concrete in constucting the dam and auxiliary work. Sand of excellent quality is obtained on Alma Island nearby. The motor power for the air compressors, rock crushers and pumps is electrically transmitted from Kenogami by Price Brothers. A standard gauge railroad 12 miles in length connects the C. N. R. near Hebertville with the power site, the two channels of the Saguenay being crossed by steel truss bridges. The bridge on the south side of the island is double tracked on account of its proximity to the work in order to facilitate the movement of the large number of locomotives used for transferring materials.

The following gives the essential facts of the power plant being developed:

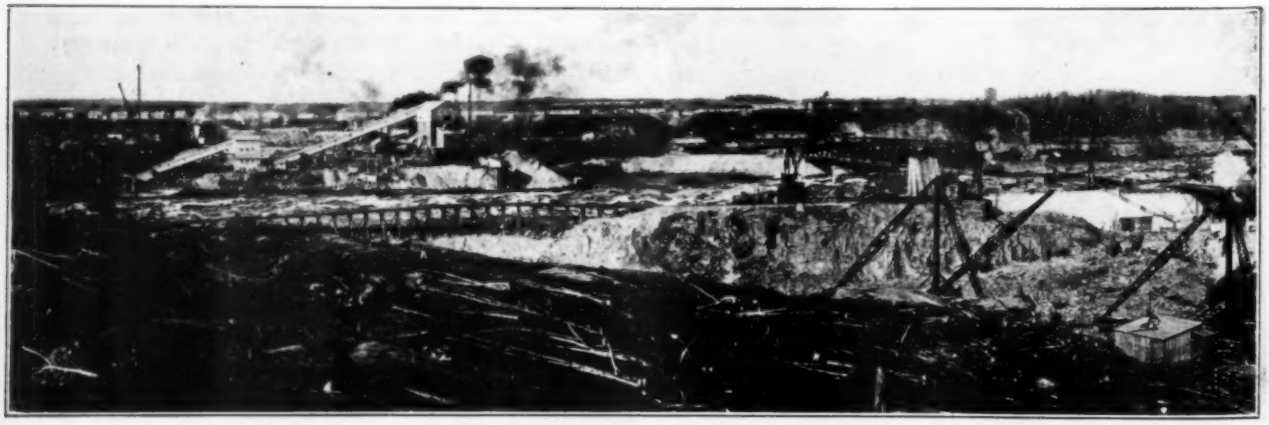
Date of starting work, January 1, 1923; expected date of completion, 1926; ultimate installed capacity, 540,000 horse-power; station equipment, 12 45,000 horse-power turbines,



12 30,000 kilowatt generators; normal head on wheels, 110 ft.; power house, 715 ft. long, max. height, 151 ft.; excavation, power house and tailrace, 264,000 cu. yd.; concrete in power house and spillway, 375,000 cu. yd.; concrete in other structures, 119,000 cu. yd.; maximum capacity of concrete plant, 200 cu. yd. per hr.; total yardage of concrete poured to date, 126,000 cu. yd.; main line Alma and Jonquiere Railway, 11 miles; yard trackage, 11.5 miles.

An interesting fact is that according to the present plans electricity will be used to displace coal or other fuel for steam generation. While this is being done part of the year at Grand Mere and Shawinigan Falls, this is the first instance where the steam plant will be entirely dependent on electricity as a source of heat.

It is understood that the cost of developing the power at Ile Maligne will be the lower per horse-power of any in Canada. As a result there is little doubt that the Lake St. John district is destined to a brilliant future along similar lines to those of Niagara Falls and Shawinigan Falls. The conditions will be particularly favorable for the electrochemical industries. There is deep water navigation up to Chicoutimi, which is about thirty miles above Ile Maligne. Thus the scenic steamer trip up the Saguenay will not be interfered with in any way.



Panorama showing present state of the new power development. The flowing water is on the west side of Isle Maligne

Speed Reducer Performance in the K. V. P. Co.

By H. A. Sparrow, M. E.

In the paper industry, where massive machines are used to grind up the raw materials for the making of paper as well as to mix it and beat it to a state where it flows freely, the machinery must be driven slowly. In order to maintain stiff production schedules the machinery and equipment must be designed so that it will do heavy duty work and operate continuously with the least amount of shut-downs and production delays possible.

The Kalamazoo Vegetable Parchment Paper Company, Kalamazoo, Michigan, is a typical example of the efficiently operated paper mill, where continuous heavy production is successfully maintained. Manufacturing parchment and wax paper at the rate of 2,000,000 pounds of each kind per month, the plant is maintaining a stiff production schedule in order to take care of the demand for their products. The plant is operating on a 24-hour schedule with three 8-hour shifts.

One of the biggest factors in the continuous dependable operation of the plant is the use of speed reducers with direct motor drive in place of open gearing, pulleys, belts and similar power transmission systems, which have in the past been extensively employed for operating massive and slow moving equipment. Realizing that many machine break-downs are primarily due to the failure of open gearing, pulleys, etc., exposed to accident hazard and the danger attached, the Kalamazoo Vegetable Parchment Paper Company drives the agitators in its large stock tanks and broke tanks through the medium of speed reducers.

The Kalamazoo Vegetable Parchment Company has seven mill type speed reducer units, all of which are operating and giving good results. The units have stood up well under the continuous operation schedule they are performing and have proven their adaptability over that of open gearing, puiley or belt systems.

These speed reducers, which are an important link in the chain of production, are of very simple construction. They are fully enclosed by a housing which is split on the center line and by simply removing four bolts the cover can be lifted off and the entire inner mechanism, which is carried in the lower half of the casing, is open to inspection.

The reduction gears are all cut gears of the wide faced, coarse pitch involute type and the shaft on which the gears are mounted is a through shaft supported by two bearings, one on each end. The gears run in oil and the bearings are lubricated by an automatic system, which assures constant flooding of all moving parts with lubricant without the use of grease or oil cups.

As already stated, the present production consists of a total of 4,000,000 pounds of paper per month. The Kalamazoo Vegetable Parchment Company is contemplating to increase this to 6,000,000 pounds per month.

The Service of the Speed Reducer

The advantages of the speed reducer in the paper industry generally may be outlined as follows:

1—DEPENDABILITY: Render 100% service, first, last and all the time. No break-downs such as may occur with open gearing, pulleys, etc., exposed to accident hazards and danger of not being lubricated.

2—MAINTAIN PRODUCTION SCHEDULES: Eliminate production delays. Keep machinery in continuous operation, thereby saving labor and materials and increasing production profits.

3—CUT ERECTION COSTS: Speed Reducers can be installed in a small fraction of the time required for open gearing, pulleys, belts, etc.

4—CUT MAINTENANCE COSTS: Speed Reducers require little maintenance as compared to open gearing, pulleys, belts, etc., which are exposed to grit, dirt and accident hazards.

5—CUT DOWN ATTENDANCE: Speed Reducers are self contained. They cannot get out of order in the way that open gearing, pulleys and belts can. They require change of oil only two or three times a year.

6—INCREASE POWER EFFICIENCY: Friction losses are cut to a minimum. Saving in power alone becomes an appreciable factor with speed reducers.

7—ASSURE SAFETY: Open gearing, pulleys, belts, etc., are a constant source of danger to attendants. Speed Reducers protect workers.

8—CUT LUBRICATION COSTS: Speed Reducers require only ¼ to ⅛ of the oil necessary for proper lubrication of open gearing, pulleys, etc.

9—SAVE SPACE: Much more compact than open gearing, pulleys, etc. This enables placing a considerably greater number of machines in the same floor space.

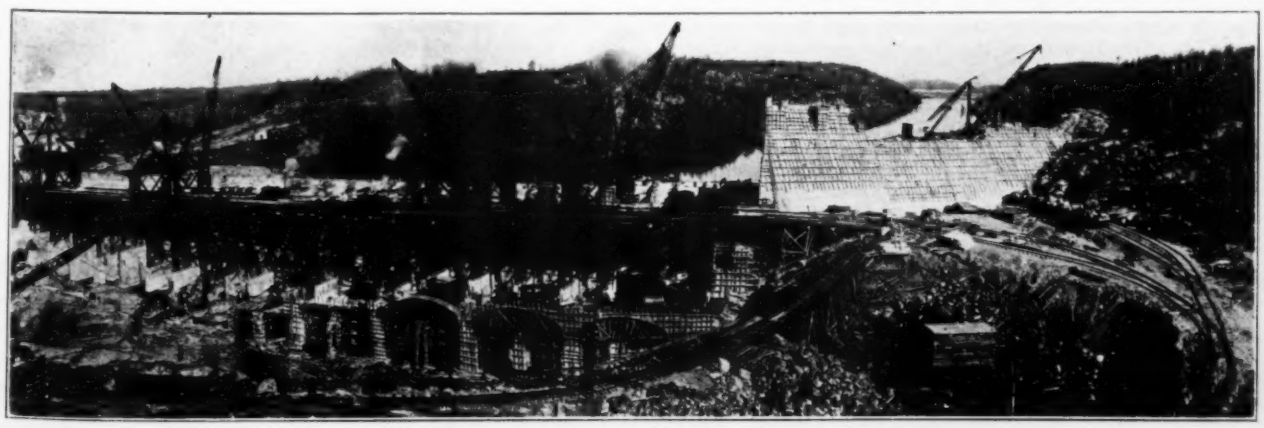
That the paper mills of the country are alive to the advantages of the speed reducer are shown by the increasingly large number of installations of this type of equipment, for both old and new work.

Foreign Work on Chemical Exposition

After a two months' trip through Europe in behalf of the Tenth Exposition of Chemical Industries, which will be held during the week of September 28th to October 3d, 1925, at the Grand Central Palace, New York, Fred W. Payne, co-manager, returned August 1st to the United States. Mr. Payne, who visited most of the countries in Europe in the interest of the International Exposition Co., has been studying conditions abroad and, at the same time, stimulating interest in the Chemical Exposition to be held next year in New York, among chemical and chemical consuming interests of Europe. He spent about ten days attending the British Empire Exposition at Wembley and visiting chemical people in England. He reports keen interest in the next American Chemical Exposition, to be held a year from this coming fall.

Following a month traveling throughout New England and Atlantic States, Charles F. Roth, co-manager with Mr. Payne of the Tenth Exposition of Chemical Industries, spent another month in the West Indies investigating the possibilities of broader use of American chemicals and equipment, and personally extending an invitation to big potential consumers of American products to attend the Chemical Exposition in New York next year. Mr. Roth spent some time among the sugar producers, and on his return recently reported that although they used chiefly British equipment at present, were much interested in new ideas in American machinery which will be displayed at the next Chemical Exposition.

Both men reported on their return the wide interest in American products in foreign markets. Their chief efforts have been to arouse this interest to the point of bringing the big foreign buyers of equipment, and finished chemical products as well, to the Exposition in the United States in 1925, and to come with the idea of replenishing their obsolete machinery with later types which will be on exhibition.

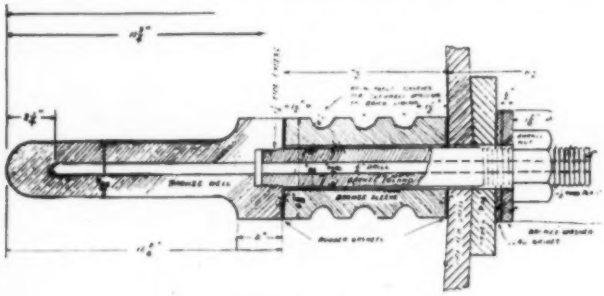


Over the east end of the dam is a view up the grand discharge on the east side of Isle Maligne

Practical Helps for the Mill Man

Thermometer Pocket for Sulphite Digester

IN THE illustration is shown a thermometer plug for a sulphite digester that can be changed at any time with very little trouble. The sleeve is set in the brick lining. The well



is screwed on the end of the gland extending through the sleeve and held tight by the nut on the outside. The well can be unscrewed and the gland taken out without breaking the lining of the digester.

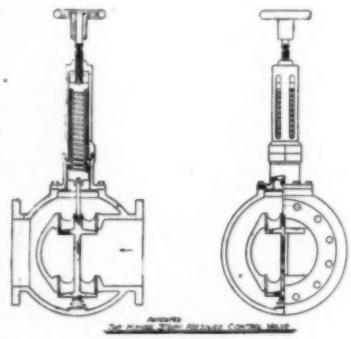
Buys Rossed Wood

SAVING freight on bark and decreasing rotting in storage, a Wisconsin paper company has effected a considerable saving in their wood cost, by buying all rossed wood. The wood is rossed by portable plants in the woods. The work is done by the contractor bringing in the wood, financed by the company.

New Reducing and Regulating Valve

A NEW reducing and regulating valve designed particularly for paper machine dryers, is shown in the sketch.

The spring can be set to maintain any desired pressure in the dryer cylinders, from the high pressure down to zero. By regulating the steam flow from the back pressure rather than the paper sheet, a much more uniform steam flow is obtained, which brings up the operating efficiency of the boilers and steam engines.



Wood Roll Prevents Fuzz

In a mill where they were having some trouble with fuzz in the paper they found that the sheet was dragging heavily over the spreader at the calenders.

They eliminated this dragging by substituting a crowned wood roll for the spreader, which cured much of their trouble.

Handling Wet Broke

A TRAPDOOR in the floor below each press opening into a chute, which goes down to the broke beater in the basement, makes a convenient method of handling wet broke from the presses. The beater takes the broke from two paper machines and is located midway between them.

New Rope Carrier for Threading Tail Through Press Rolls

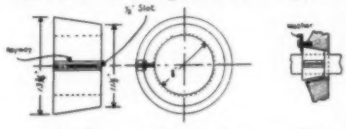
THE Manistique Pulp & Paper Co., of Manistique, Mich., has installed a new Sheehan rope carrier which takes the tail through the press rolls over onto the dryers. A big advantage of this appliance lies in the fact that it can be used with the paper running through the third press in either direction. By running the sheet through in the opposite direction it is estimated that 350 pounds of coal per day can be saved as a result of a dryer sheet going from the presses. However, on a news machine running 700 feet per minute this is apt to give trouble in taking over the tail. This was eliminated by the new rope carrier taking it over onto the dryers.

No More Motors Burned Out

IN A case where the felt stretch rolls were operated by individual electric motors, the men would frequently throw in the switch starting the motor, then go away and leave it running until the felt was tightened to the limit and the motor burned. To overcome this, the electrician put in a Bulldog switch type MF 351, making connections to the upper posts without using the fuses. This made it necessary for the man operating the switch to stay there and hold it in. The minute he lets go, the switch is thrown out.

Brass Bushing for Grinder Flanges

THE above sketch shows a brass bushing which saves much time and work in taking off the flanges when a new stone is to be put in. After the flange is slightly loosened it slips down on the tapered bushing, allowing the slot in the bushing to spring open more, so that it may be easily unscrewed. Before tightening, the slot is filled with a steel wedge to keep it from closing and binding on the shaft. In putting on the flange it is kept from sliding off the bushing by a ⅝-in. cap screw and washer, which catches on the face of the bushing, as shown.



Reclaiming Dept. Saves $350 Monthly

IN PLACE of haphazardly picking over the scrap heap looking for material that might possibly be used, the Consolidated Water Power and Paper Company of Wisconsin Rapids has accomplished a saving averaging $350 per month by systematizing their reclaiming department. Under this department comes the cleaning of the mill, salvaging of used material, inspection of fire equipment, elevators, scales, etc., according to schedule, and painting in the mill.

In order to keep the mill clean, a man is placed in each department. In addition to cleaning, it is his duty to keep everything picked up and turn anything of value in to the reclaiming department. In this way the mill is kept absolutely clean and nothing is thrown away. The material turned in by the cleaners is looked over by two mechanics, and that which is as good as new returned to the storeroom. Odds and ends that are not standard equipment are kept on the shelves in the reclaiming department along with other old material.

Inspection of certain mill equipment is carried on according to schedule as follows:

Monday, fire equipment; Tuesday, scales; Wednesday, ladders, chain blocks, guards, railings; Thursday, trucks; Friday, elevators; Saturday, floors and electric light extensions.

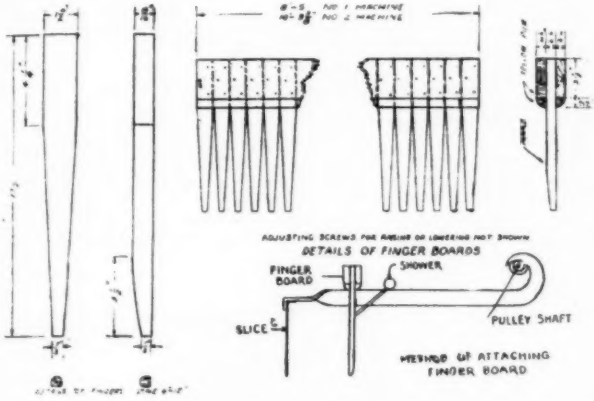
Two painters are kept busy around the mill carrying through the idea of keeping everything in shape. Records are kept of material received from each department and that returned to the storeroom. Daily reports are made on inspection and material served, showing exactly what is done and attempts made to bring about steady improvement in these figures.

Finger Board Used to Give Uniform Sheet

BY ATTACHING a finger board, as shown, the variation in weight across the sheet in one instance was reduced from 2.5 lbs. to 0.5 lb., by the effect of the fingers in breaking up the eddy currents in front of the slice. The board is made of maple fingers held together at the top by pine cross pieces, and coated with shellac. The bottom of the board is ordinarily placed ½ in. above the apron, but can be raised or

lowered with the slice. The fingers seem to have the effect of slowing up the stock.

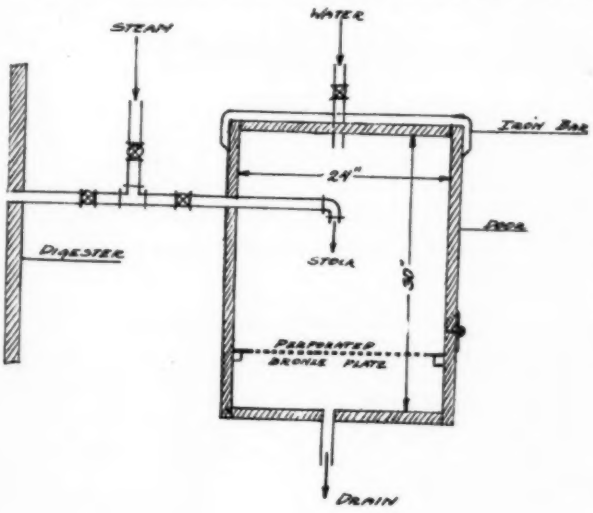
In one case after the board was removed, the vacuum on



the suction boxes dropped 2½ inches and the sheet became very wild. Although many are familiar with the use of the finger board, this is printed with the hope that it may be of benefit to someone.

Digester Stock Sampler

A CONVENIENT apparatus for taking a sample of pulp out of the digester before it is blown is shown in the sketch. The stock is blown out of the digester through a ¾" pipe

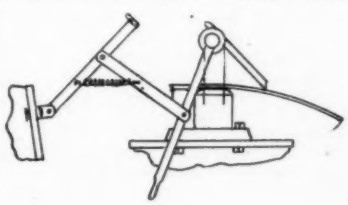


DIGESTER STOCK SAMPLER

into a closed wooden box catching the stock on a perforated plate. The ¾" line is provided with a steam connection for cleaning out, and a water pipe is connected into the top of the box for washing the stock. Patent has been applied for this apparatus by a U. S. mill.

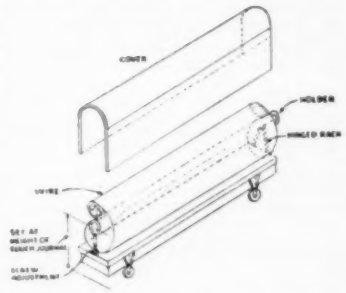
Device for Raising Doctor on Dryer Cylinders

A DEVICE to raise and lower doctors on dryer cylinders, keeping them lifted from the cylinder surface when running along ordinarily so that will not wear, is shown in the illustration. With the levers in the position shown, the coil spring holds the doctor against the dryer and when pushed down to a position slightly below horizontal they are caught and held in this position, lifting up the doctor.



Truck and Holder for Changing Wires

IN THE illustration is shown a truck for the holder and wire that has been used to advantage in a number of mills in putting on wires. The holder is carried on a truck, one end supported by a screw which can be set at the height of the couch roll journal so that it may be easily slipped over the end without loss of time, the other end supported by a hinged rack which may be lowered out of the way. The wire is looped around the holder with the poles held in place above. It is estimated that this saves about twenty minutes in putting on the wire and eliminates much danger of injuring the wire.



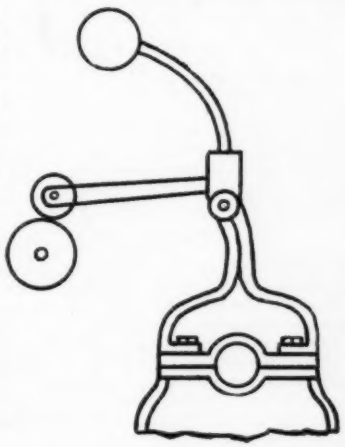
Electric Alarm for Breaks

AN ALARM that will always give the signal when the paper breaks is made by placing a wire so that it rests on the sheet and drops into a small cup of mercury when the sheet breaks, thus closing the circuit and ringing a bell. When the wire drops into the cup of mercury, a contact is formed that is not affected by vibration.

A wire and cup is placed at each side of the sheet so that the instant the paper breaks the alarm is given, also registering on a recorder.

Rough Edges Trimmed Before Sheet Enters Dryers

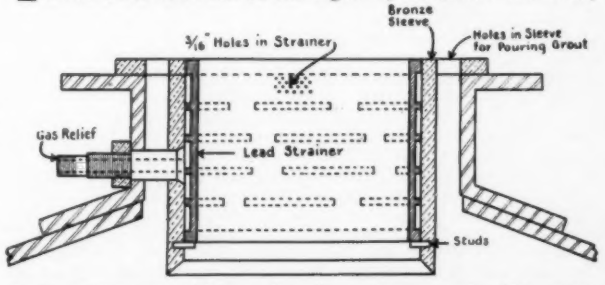
TROUBLE caused by rough edges made on a board machine when the deckles on the cylinders were not in perfect alignment, was eliminated in one instance by trimming the edges as the sheet enters the dryers. A simple cutter was made and attached, as shown. The trimmed edges go into a tank in the basement and are pumped back into the stock chest.



Time has been saved in washing felts by making flat nozzles at ends of inch and a half pipe, placed at various points.

Top Relief Connection and Strainer for Sulphite Digester

THE illustration shows a top relief connection and strainer attached to the neck of the digester, instead of the cover,



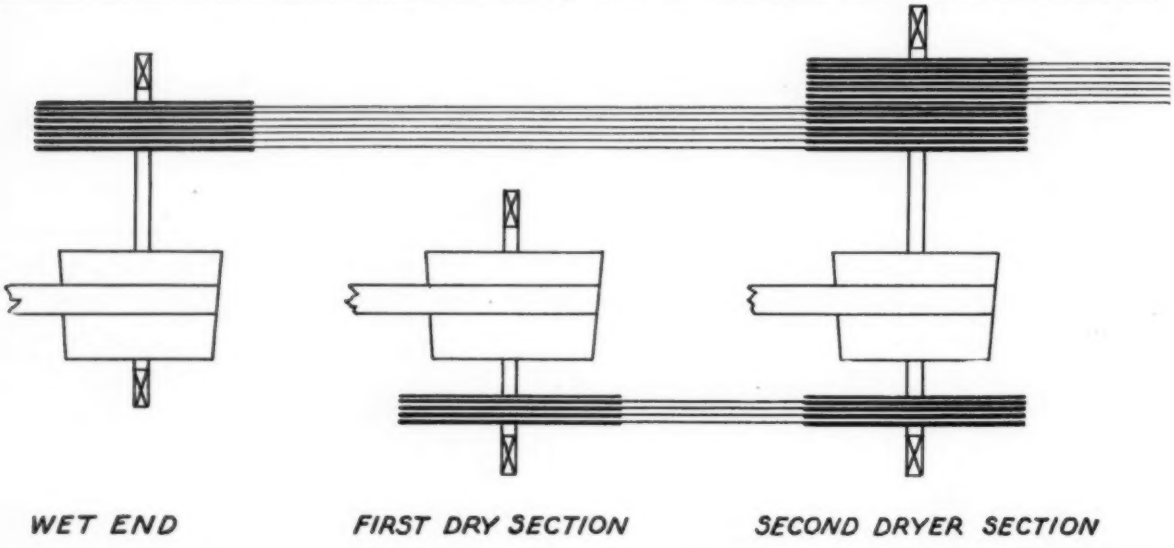
as is customary. This makes it unnecessary to disconnect any piping when removing the cover after blowing and gives a large area for straining the relief, so that the strainer is

not easily plugged. The nipple extending through the bronze sleeve is beveled on the end so that when drawn up by the nut on the outside, it is wedged into the sleeve, making a tight connection. The strainer, perforated with 3/16" holes, is set inside the bronze sleeve, supported by the stud bolts. In this case, where there was not room for the standard hexagonal nut on the outside, a socket wrench was made to fit into four notches in a round nut.

Efficiency of English Rope Drive Increased

IN AN instance where the English rope drive was used, power was transmitted from the second section of dryers to the first and from there to the wet end. As the sheaves were placed only 12 feet apart from center to center, trouble resulted from the ropes slipping.

This was remedied by driving the wet end directly from the second section as shown in the sketch, thus increasing



the center to center distance of the sheaves carrying the main load. The first dryer section was driven by three ropes on separate sheaves as shown. Approximately one third more power was obtained in this way from the same number of ropes.

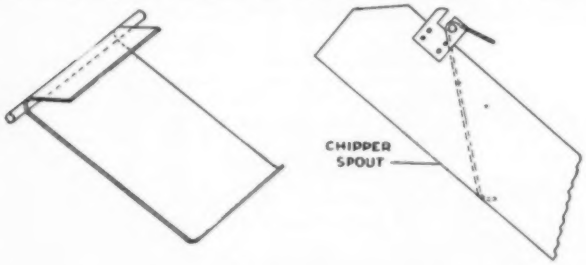
Drying Pulp Hand Sheets

IN DRYING sheets from a hand mould the sheets are pressed between sheets of soda pulp to absorb the water. Some soda pulp, however, will stick to the sheet unless something is placed between. Linen cloth served very well, but is quite expensive, so paper was substituted.

The sheets are died in the oven between the two sheets of paper which prevents wrinkling of the pulp sheet.

Guard for Chipper Spout

VERY often blocks and chips of wood fly back out of the chipper spout, occasionally hitting the chipper man and resulting in cuts or bruises. An effective guard to prevent the blocks from being thrown back is shown in the illustration. The guard is made of sheet steel attached to a round



bar, and swings in slotted holders attached to each side of the chipper spout. As the wood is fed into the chipper the guard lifts up, falling back into place after the block has passed and closing the spout.

Novel Moisture Remover

RECENTLY an engineer in one of the paper mills on the Pacific Coast invented the idea of attaching fan blades onto the outer end of spokes on the dryer drive wheels of paper machines. The object is to remove moisture, effecting quicker drying at lower cost. This is most adaptable on machines running 500 F.P.M. or better.

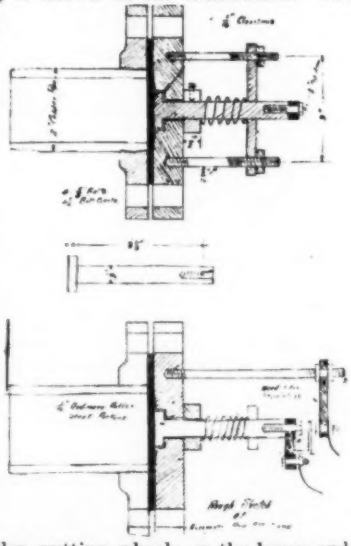
Pump Handles Two Kinds of Stock

IN A mill making board from chip and news stock, a two cylinder stock pump is used to pump the stock from the machine chest. There are three valves on the suction line, one close to each chest and one in the line between the two cylinders. The valves can be manipulated so one cylinder pumps out of the chip stock chest and the other out of the news stock chest into separate compartments in the head box, or if it is desired they can be set so that both cylinders will pump out of the same chest.

The same arrangement is used for pumping from the beater chests to the Jordans.

Blow-Off Alarm for Digesters

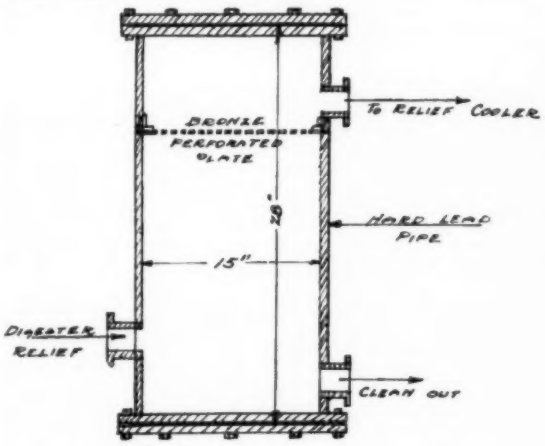
AN EFFECTIVE device for giving an alarm while the digester is blowing, is shown in the illustration. The two-inch copper pipe screws into the side of the blow-off valve, or the blow-off pipe. As soon as the valve is opened, the pressure on the rubber diaphragm pushes out the plunger and closes the circuit, ringing a bell. The device has been working successfully in one mill for about three months. The pipe does not get plugged with stock and it has not been necessary to change the diaphragm. A low voltage bell with a transformer was found to work better than a bell working on 110 or 220 volts.



A machine shop foreman found it difficult to keep a ladder around when it was needed for oiling, putting on belts, etc. He made a new ladder, putting wheels on the lower end and hooks on the other to hook on a shaft or rack on the wall. He has had no more trouble with lending the ladder.

Strainer for Sulphite Relief Liquor

IN A mill where they were using a cooking acid with a high percentage of lime they were having some trouble with scale forming in the relief coolers.



STRAINER FOR SULPHITE RELIEF LIQUOR

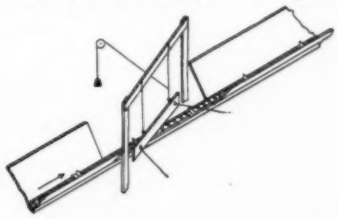
To remedy this a separator was placed in the relief line between the digester and cooler. The liquor is filtered through a perforated bronze plate and much sludge and dirt collects in the bottom that formerly went into the cooler.

Counterweights for Grinder Doors

IN A ground wood mill where it was necessary to break in a number of new men every season during the high water, the new men always had more or less trouble with the doors on the vertical pockets on the grinders in lifting them up, and occasionally they would fall down, sometimes smashing the fingers of the grinder men. This trouble was remedied by attaching a counterweight with a rope running up over two small pulleys. The counterweight holds the door in any position and has eliminated much trouble.

Swinging Shear

IN ORDER to prevent blocks of wood from being carried across an open space in a conveyor where the wood is transferred to the next conveyor, it is usually necessary to have a man at this point. In one instance this trouble was remedied by making a swinging shear. The shear is suspended on two cables with two more holding it from the side, as shown. The front end is held in place by a rope attached to a counterweight. As the flights on the chain move along they hit the front end of the shear, shoving it to one side. After the flight passes, the shear swings back into place, knocking off any blocks that stay on the chain. This has made it unnecessary for a man to stay at this point to watch the wood.

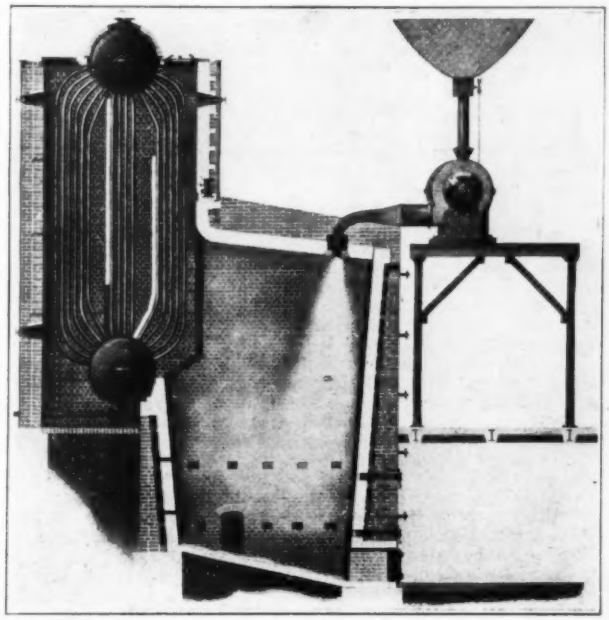


Adjustment for Motor Driving Stokers

IN AN instance where it was desired to place the motors driving stokers directly above the drive pulley, a silent chain drive was used. In order to take up slack and keep the motor in perfect alignment, the base was placed vertically. In addition to the standard adjustment for taking up slack, the motor is kept in line by two screw adjustments attached to steel plates and placed at opposite corners to counteract the chain pull. With this adjustment, the cutting of the chain on the sides when the motor was pulled slightly out of line was eliminated.

The Correct Illustration

The description of the new pulverized fuel installation at the Consolidated Paper Co., Monroe, Mich., which was published in our July issue contained a drawing which was supposed to be of that installation. It was in error, however, as the new boilers are of the vertical water tube type, and the powdered coal is blown from the pulverizers directly into the top of the furnace. The accompanying illustration is correct.



New Improvement Enables Great Reduction in Wood Room Crew

A Wisconsin paper company have made new improvements in their woodroom recently, enabling them to reduce their wood room crew from 35 to 12 men. A new saw carriage, conveyor system, barking drums and tank to wash the wood as it comes from the drum, were installed.

Work on Proposed Mill Abandoned

According to reports from Neenah, Wisconsin, the plant which was started at the Valley Paper Mills Company about two years ago is not going to be completed this year as it was expected it would be.

The Valley Paper Mills Company was organized and plans were completed for a mill. Work was started and about one-half of the foundation work was completed when the work was abandoned, and it was thought that this work would be taken up again this year.

A good deal of stock was sold to investors in the vicinity in which the paper mill was to be located, but those at the head of this project have turned their attentions to other interests so it looks as though this project has been abandoned.

Mr. D. B. Davies, who has been assistant mill manager of the Northern Paper Mills Company of Green Bay, Wisconsin, for the past two years, has tendered his resignation with that company, and has accepted a position as manager of the Fibre Division of the Hoberg Paper and Fibre Company, also of Green Bay, Wisconsin.

The new dam and 12,000 H. P. power plant of the Alpena Power Company, on the Thunder Bay river, seven miles above Alpena, is expected to be completed early in the fall. Mr. H. E. Fletcher is in charge of the work with Gardner S. Williams consulting engineer. After completing this work they will rebuild the forebay and tail race of the four mile dam.

In many places in stock lines and plates on pumps, rubber gaskets will not last long. Gaskets made of tar paper have been substituted with excellent results.

New Method of Board Drying

By H. R. MASTERS

Special Engineer, The Coe Manufacturing Company,
Painesville, Ohio

THE problem of drying thick, flat boards from 1/16" to 3/4" thickness, which are too heavy to be dried on the regular paper machine dryers, is becoming of greater importance, but has as yet received but little consideration from paper mill engineers.

Under this classification come:

1—Pasted boards, such as fiber wallboard, made of several plies of paper, previously dried on standard paper machine. Owing to the water added in the paste such boards will contain excess water, which should be removed before shipping.

2—Binders board, counter board, press board, fiber board, etc., made up of any desired thickness in laminations on a wet machine.

3—Composition board, using paper on the outside, and some other material such as gypsum, cement, plaster, or wood for a hard interior core.

4—Insulation board, which is a comparatively new product made from waste materials, such as ground wood and sulphite screenings, old paper, flax, corn stalks, bagasse, etc. These materials are first subjected to a reduction treatment, such as shredding, cooking, beating, etc., and then formed into a continuous thick sheet over or between large wire screen rolls, which are, as a rule, designed special for the material. Some of the water is then removed by squeeze rolls or a hydraulic press, but the board will still contain from 200 to 300 per cent water, which must be removed in the dryer.

The finished boards are now being extensively used as a direct substitute for lumber in building construction, such as sheathing, wallboard, plaster and stucco base, insulation, etc. They are also used for insulating refrigerators, railroad cars, and for making shipping boxes and containers. Specially treated or chemically impregnated boards of great strength can be finished or painted the same as a wood panel, and used for the manufacture of furniture, radio cabinets, etc.

Owing to the great variety of uses the demand for such product is increasing and is almost unlimited, so it is believed that processes for utilizing other waste materials in this manner will be developed, thereby rendering valuable service as regards conservation of our timber supply.

Few people realize the enormous inroads that have been made on our forests by indiscriminate cutting, slashing, and burning, so that the day of substitutes for lumber in building construction so long predicted is undoubtedly now at hand, and in future more and more wallboard, gypsum, brick, etc., must be used in our houses. To take one concrete case, the use of gypsum wallboard has doubled every year for the past four years, largely due to the efforts of only one large company.

The paper industry as a whole, such as book, coated paper, boxboard, etc., seems to be expanded almost to the limit in this country, so the existing mills have no difficulty in supplying the demand, and competition is very keen. The manufacture of thick, heavy boards, however, is more of a virgin field, so the few concerns that have seen the possibilities and gone into this business are in most cases unable to supply the demand. The prospects are that it will take a number of years for the supply to overtake the market, so the profits should be correspondingly larger than in the ordinary branches of the paper industry. Undoubtedly some of the best chemists and engineers in the country will devote their time to the development of this business, and much has already been accomplished.

But Two Methods Previously Used

Heretofore there were only two available processes for drying such boards, which has, of course, greatly limited developments.

1—Some boards such as binders board, leather board, etc., were dried on hot steam pans, which made the boards curl and warp very badly, so it is not extensively used.

2—The tunnel kiln, either compartment or progressive type, where the boards are dried by heat and air circulation while hung or mounted on racks or trucks. As a rule, a lot of handling and a number of hours, sometimes twenty-four hours for thick boards, were required for drying, so the process was slow and costly. The boards also warped badly and frequently needed calendering. The capacity of a single kiln was also very small.

The new method developed by the Coe Manufacturing Company is a high temperature automatic drying machine, which dries the board in flat sheets moving continuously over or between a smooth bed of rollers. The machine is built entirely of iron and steel completely enclosed and insulated with one or more decks of rollers of suitable width, and the heat obtained by steam coils between each deck of rolls. A system of steam circulation at high velocities in stages, with condensate removed by tanks at intervals, similar to that used on many regular paper machines, is now used. With high pressure steam, temperatures as high as 340° F. may be obtained.

There is also a fan circulating system, so that a high air velocity is maintained thru the dryer and over the surfaces of the moving boards, materially increasing the evaporation and the saturated air is removed by suitable vent flues or exhaust fan. The boards pass first into the low temperature, high humidity zone to prevent blistering, then progressively through the dryer with the temperature increasing and the percentage of humidity decreasing. Some boards, such as gypsum board, require different treatment, however, and the temperature and humidity in the different stages of the dryer may be varied to suit the product.

The boards are all fed in through slots at one end of the dryer onto the different decks by an automatic transfer and feeder, operated in connection with the cutter and the wet machine. This usually requires one operator, and two operators are required at the dry end to receive the finished boards. The speed of the rollers may be varied to suit different thicknesses and classes of board, which are dried on a definite continuous schedule.

The dryer is built in two types: First—those having double rolls so that the material to be dried passes between rollers as it moves from the wet end to the dry end, and the surfaces are very flat and smooth; second—the single roller dryer in which there are no top rollers resting on the board, so it is not compressed and the insulating qualities are fully retained. This is used only for such boards as insulation board, gypsum wallboard, etc.

The major portion of the air is recirculated, but one of the new developments is in the heat recovery from that portion of the hot air and vapor which is removed by the exhaust fan. This may be utilized for heating water used in the manufacturing process, but preferably for heating fresh air taken from the outside, and drawn thru a specially constructed economizer or interchanger, consisting of corrugated plates forming air passages. The hot vapor laden air passes thru one set of passages transmitting heat to the cold air passing through on the opposite side, which air may then be used for heating purposes, or for supplying warm make-up air to the supply fan system. The steam used in the dryer for evaporating a pound of water is therefore low, and the labor and operating costs are comparatively small.

The product is of a very uniform quality, comparable to that from a paper machine, and the percentage of waste or culled boards may be greatly reduced as compared to the old style tunnel kiln. To take some specific cases, averaged over a period of several months, on pasted fiber wallboard, the culled boards averaged only 1½% of the output; on gypsum wallboard the culls average 4%, due mostly to edges damaged or broken in the forming machine.

The following records have been obtained in actual production with the automatic roller dryer:

Redrying 1/4" pasted wallboard, removing 8% water, 6 minutes.

Drying 1/8" binders board, containing 55% water, 60 minutes.

Drying 3/8" gypsum board with paper covers, 70 minutes.

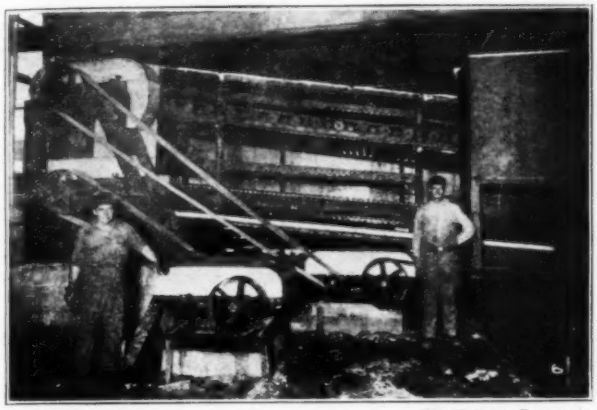
Drying 7/16" thick insulation board, removing 200% water, 110 minutes.

Largest Dryer Ever Built

The accompanying photographs show one of the largest mechanical dryers ever built, recently completed at the plant of the Celotex Company, New Orleans, La., for drying insulation board made of bagasse, or sugar cane refuse. This is one of the outstanding developments of 1924, because this material was formerly burned up under boilers and had little value. The Celotex Company have installed extensive baling stations in Louisiana to collect the material, which is shipped

to their plant and stored, thereby insuring an ample supply of raw material at all times.

The dryer proper is two decks high, 800′ long with rollers 13′ 6″ wide, and fed continuously by two separate wet machines, forming the board at a speed of about 7 lineal feet per minute. Thus there are two continuous sheets 12′ wide, 800′ feet long, passing thru the dryer over the rollers. Figure 1 shows the driving arrangement at the dry end, consisting

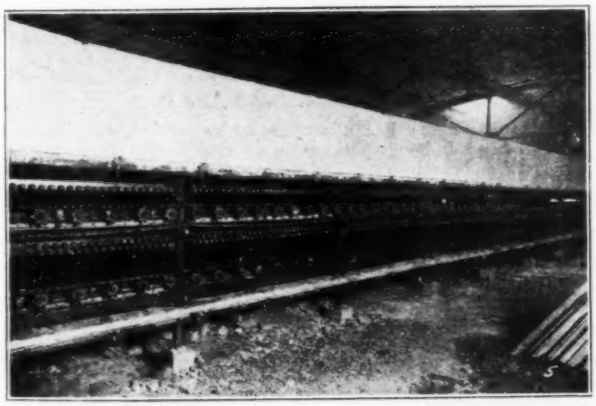


The Celotex Company.

Figure 1. Dry end of board dryer

of a drive rig, variable speed transmission, and 10-horsepower motor for each deck, so that the speed may be varied for different thicknesses of board on either deck independently. The rollers are provided with gudgeons at each end, revolving in ball bearings, and driven by special long chains running from the drive rig the entire length of the dryer, engaging with sprockets on one end of each roller gudgeon.

The dryer is very completely enclosed and insulated with 85% magnesia blocks, the side panels being removable, and steam coils are provided under and over each deck, using steam at 160 pounds' pressure for heating. Four very large Multivane supply fans are used for circulating 200,000 cubic feet of air per minute thru the dryer by the Coe patented cross nozzle air circulating system, most of this air being recirculated and used over again, as at the high temperatures used the air will carry a very large amount of water vapor without being saturated.



The Celotex Company.

Figure 2. Middle of board dryer with doors removed

Figure 2 shows the central part of the dryer with the side doors removed, and it will be noted that the dryer is built in sections for expansion, mounted on concrete piers. Owing to the extreme length of the dryer and the warm climate, a very cheap type of building is used, with a dirt floor so the dryer is provided with a metal bottom pan insulated with magnesia blocks. The view clearly shows the steam coils, rollers, sprockets, chain and recirculating air duct on the top.

After passing thru the dryer the boards are cooled by passing thru a special open cooling section and trimmed to size, by automatic cutters, so the labor costs are very low in view of the capacity, which is over 250,000 square feet of 1/2″ thick boards, or about 80 tons per twenty-four-hour day. Some idea of the enormous size of this machine may be obtained from the following figures: The complete dryer weighs over one million pounds, contains 3,600 rollers, about 40 miles of 1¼″ steam pipe for heating, required 120,000 square feet of magnesia blocks for insulating, evaporates 13,000 pounds of water per hour from the board and requires approximately 900 boiler horsepower of steam at 160 pounds pressure for operating.

Other installations of a similar nature have been made for such concerns as the Beaver Board Company, the United States Gypsum Company, the American Gypsum Company, the American Cement Plaster Company, etc. These dryers were of the multiple deck type, either 4, 5, 6 or 8 lines high, and not of such extreme length, with rollers 9′ long for handling either two 48″ or three 32″ boards (in width) at the same time on each deck. In view of what has been accomplished in the last two years, it seems safe to predict a much greater development for the near future in the manufacture of thick and heavy boards.

Getting the Most Out of Soot Blowers

By K. Rankin

Most of the information about mechanical soot blowers deals with the manufacturers' viewpoint, improvements and what they save. What engineers need more, because it is a matter over which they have control, is how to get the most out of their soot blowers by more careful and intelligent operation.

When mechanical soot blowers are used more intelligently, they will last longer, consume less steam, require fewer repairs and prove an even better investment than they are now. A few of the conditions encountered in many plants may serve to attract attention to this important matter.

Steam Consumption

The steam consumed by the blowers can often be cut in half and usually reduced at least 25 per cent, by more careful and intelligent blowing.

The steam consumption per blower element at a given steam pressure should be known, as well as how long each element should be opened, so that the total steam consumption for the entire operation of soot removal may be determined either by actual measurement with steam flow meter (difficult to obtain accurately because of the low-scale deflection) or by calculation from Napier's formula:

$$W = \frac{p\ a}{70}$$

Where W equals lbs. of steam flowing per second
p equals absolute pressure per sq. in.
a equals area of orifice in sq. in.

Not all nozzles require the same time to do their work. Some have less work to do than others. This fact should be self-evident. Yet it is a fact often overlooked. The nozzles nearest the fire, that is those nearest the front rows of tubes, have the hardest work to do, because ash, carbon and flue gas dust impinge directly upon them. They do, therefore, ordinarily need to be operated the more often and kept open longer.

The engineer who watches his equipment and uses his instruments will often find that the first two elements can be blown for one minute once or twice a day while the remaining elements require only 30 seconds once a day. Of late, boilers are being set to absorb in increasing amount of heat from the furnace as radiant energy, which means the first few rows of tubes do an increasingly great amount of work. The front element should be used oftener, therefore, in the endeavor to fully utilize the radiant heat available.

If there are 16 elements and each consumes 450 lbs. of steam per minute at 250 lb. gauge, with steam costing 45 cents per 1,000 lbs., it is readily seen that to operate these elements 60 seconds instead of the 30 seconds, that may suffice, causes a needless flow of $1.62 per day. Based upon 6 days a week, every week in the year, it can be seen that this one item of $505 alone would go a long way toward paying for renewals —or an increase in wages for the engineer.

It is well to differentiate between the boiler and superheater elements, because to blow both when only the one set needs blowing is to waste steam. The thermometer in the steam line to show the degree of superheat, will quickly show when the superheater element needs to be operated.

The degree of superheat, as well as the steam temperature, gradually fall as the stack temperature gradually rises with the accumulation of soot.

A thermometer in the steam line often indicates that the superheater element can be used to advantage, where the

boiler elements do not need to be used. As it is not uncommon to find a decrease of 25 degrees in superheat within 48 hours of continuous operation where the soot blowers are not used, it can be at once seen that closer attention to the superheater element is well worth while.

Some boilers require soot blowing twice a day, for others every other day suffices, while for others once a week is adequate.

Maintenance

Maintenance costs can be largely reduced by more careful operation on the part of the boiler room force, heating of the elements due to their location cannot be prevented but the effect can be combated; it is inherent to their location. But the avoidance of water and moisture in the steam should be religiously undertaken under all circumstances.

Wet steam and slugs of water resulting from inadequate design, improper installation or defective drainage, are often the major causes of depreciation, failure and consequent high upkeep cost. This explains why one station will have a maintenance cost so much higher than another with apparently identical conditions. In many instances the maintenance and replacement costs, directly chargeable to wet steam and slugs of water, exceed the cost of all other items of expense combined. This fact cannot be stressed too strongly or too frequently, particularly to new men and men who have never before operated mechanical soot blowers.

It certainly would pay to tabulate the various items involved in the cost of maintaining and operating mechanical soot blowers. These data should record the date repairs were started, and completed; what work was done and to which elements, why the repairs or replacements were necessary, what causes the failure and anything of special significance connected with them, and when the last repair was made. This information not only gives a good indication as to where the trouble lies—in manufacture, installation and operation—but it is the first real step toward alleviating or eliminating the underlying cause. Such a log would be indeed surprising in many plants. It would be an indictment against the plant personnel and a verdict of "not guilty" for the manufacturer, who is now so often compelled to shoulder the blame and the expense for a situation he is powerless to control.

Lessening Puffing and Smoking of Fires

The disturbance of soot and ash that often accompanies soot blowing can be considerably lessened if not eliminated entirely by always opening the stack of breechings and ash pit dampers wide before blowing, regardless of the rate of combustion. The soot and flue-gas dust liberated by the steam will then be carried up the stack by their own impetus, to be carried on their way by the draft. The high velocity of the upgoing gases will also minimize the amount of flue-gas dust and soot redepositing upon the boiler surfaces.

Where soot blowers elements in a direction opposite to the flow of gases up the stack, puffing and smoking of fires may persist. Keeping stack and ash pit dampers wide open minimizes this, however, and lessens the amount of dust that may resettle upon the surfaces within the boiler passes.

It ought hardly to be necessary to point out that the lowest element, which is that nearest the fire, should be operated first, each element in the direction of gas flow being taken in consecutive order.

The improvements and refinements in mechanical soot blowers should not be allowed to bring about less care in using them. Rather, they should be used to encourage greater care in the effort to bring about longer life, lower maintenance costs and higher over-all economy. It is, perhaps, "up to" the soot blower manufacturers to drive these facts home.

A Brief History of Wall Paper

By W. G. DAVIS

WALL PAPER is an outgrowth of the early Greek and Roman custom of draping the walls of their homes and public buildings with beautiful woolens, silks and linens to relieve the monotony of their marble or plaster walls.

For the more prosperous classes these hangings were not only of expensive materials, but were also usually embroidered with elaborate designs or took the form of magnificent tapestries. For the lower classes were plain materials, but even these were expensive and the great mass of people felt the need for some sort of covering that would give a pleasing look to their walls, but at the same time would be within their means.

Paper seemed to be the answer, and once the idea was evolved its use spread rapidly. Originally a very crude affair, used only by the poorer classes, it was soon seen to have unlimited possibilities and on its own merit has gradually risen to its present standard.

The exact origin of wall paper is more or less hazy, three countries, Holland, France, and England, all claiming the honor. The oldest examples of European wall paper, however, have all been discovered in England. These, as well as all early wall papers, were hand-painted and date back probably to the latter part of the fifteenth century or at least early in the sixteenth.

The earliest specific reference to block-printed papers, the next step from painted papers, comes from Holland and indicates such types being made as early as 1568. In the painting or hand-block printing of wall papers no attempt was made at first to have a continuous design such as we now use. Each sheet was made separately and formed a separate panel.

Notwithstanding the developments in England and Holland, the greatest popularity for wall papers was in France, and in 1688 Jean Papillon started the first great printing house. In addition to his fame in this direction he apparently originated the idea of a continuous design, although this did not entirely supplant the wood-block system for many years.

In 1830 the idea of using cylinders in place of wood-blocks for printing continuous designs was perfected, the idea being an adaptation of the method employed for printing cottons and linens which had been in use since 1797. In 1835 a one-color printing machine was invented in England and in 1839 one was brought out which would print four colors. Although being operated by hand, its production was 200 rolls a day, a great increase over previous methods.

The first color printing machine in America came from England in 1844 to the Howell factory at Albany, N. Y. This was one of the first factories of its kind in this country and was owned by John Howell and his son. Most of the wall-paper printers in this country at that time, including the elder Howell, obtained their experience abroad, but even with the improved machinery they could not produce the better qualities which continued to be imported. Good papers came high, one room costing at least $100 with an additional $40 for hanging. This was exorbitant considering the value of money in those days.

Gradually, however, the industry developed and improved its machinery and methods until all grades and designs could be made at low costs as at present. The modern twelve-color cylinder machines, handling 1,500 ft. rolls of paper, with all printing and drying done automatically, is a far cry from the hand work of a few centuries ago and is an excellent example of progress.

By-Products from Sulphate Pulp Process *

By J. ARMAS HELIN

Stebbins Engineering & Mfg. Co.

THE title above is not new as we know that this question has been under consideration as long as the sulphate pulp process has been known; and many and various methods more or less successful, have been used and patented to obtain the other valuable products from wood besides fibre.

Although it is more than ten years since practical methods in this line were adopted in Scandinavian mills, the extracting of by-products has shown very little development in this country. Whether the other less successful attempts discouraged the manufacturers, or whether the prosperous pulp business without any by-products had a tendency to crowd out this industry, the writer is unable to ascertain, and a discussion of this point would lead too far away from the main topic.

The methods along this line which I am familiar with are those which Messrs. Bergstrom and Hellstrom have invented and developed.

In this connection, we have to distinguish between the products taken from relief gases and those extracted from black liquor.

From the first process mentioned above, we get turpentine, if resinous wood is used, and in any case, we extract wood alcohol. Then, by a refining process, ammonium sulphate is produced.

In the second instance, the by-products reclaimed from black liquor are several, depending on how far the qualification and refinement methods are carried, but the most im-

*Presented at the meeting of the Chemical Pulp Division of the Superintendents' Association, held at the Manchester Hotel, Middletown, Ohio, during the Fifth Annual Convention, May 23, 1924.

portant of these are rosin oil, pine oil, crystal rosin and pine soap.

We will first take up the manufacture of turpentine.

Relief gas from the digester going through the catch tanks, liquor heater and condenser, or direct from the catch tank to the condenser goes to the separator, a small tank with gauge glass where the turpentine separates from the water. From there, the turpentine goes through a measuring tank to a storage tank, and from this storage tank to the distilling apparatus where a very harmful, poisonous, and disagreeable smelling oil called methyl sulphide is distilled off from the turpentine.

After the first distillation, the turpentine goes to the wash pan where it has to be washed with sulphuric acid, water and caustic soda solution. When the washing is completed, the turpentine is ready to be taken to the next distillation. Through this rectifying process, a hundred percent pure, unadulterated turpentine is obtained which quantity is at least twelve pounds per ton of pulp. Sometimes this amount might be doubled if the pine used for pulp cooking is as rich in turpentine as the pine in the southern states.

This refining process requires steam and chemicals in the following proportions:

	Price
5.4 lbs. steam per lb. turpentine	$ 0.189
0.08 lbs. sulphuric acid per lb. turpentine	0.08
0.02 lbs. caustic soda per lb. turpentine	0.06
	$ 0.329

So from the above schedule, we can readily see that a mill with a daily output of 100 tons of pulp could recover 100 x 12 = 1,200 lbs. per day, or 165 gallons daily. The price of turpentine today is 80c per gallon which means the daily product would amount to 165 x 80 = $132.00.

Deductions	Price
Power	$ 4.00
Materials (steam included)	4.00
Labor 2 men @ $5.00 per day	10.00
Net Income per day	114.00
	$132.00

300 working days per year.

Net income yearly 300 x 114 = $34,200.00.

The other product from the digester relief gas is wood alchohol, as mentioned above.

This is distilled from the water from the turpentine separator above referred to, and also from blow-off condensation where surface condenser is used for blow-off gases. The distillation process is practically the same as in the regular manufacture of alcohol, with this exception: We use sulphuric acid in order to take off the ammonia, and as these two chemicals combine to form ammonium sulphate, we call this as a by-product too, although the amount is very small, approximate 1 lb. per ton of pulp.

The yield of wood alcohol is 3 lbs. per ton of pulp, and the cost as per table below.

	Price
10 lbs. steam per lb. alcohol	$ 0.35
0.42 lbs. sulphuric acid per lb. alcohol	0.42
	$ 0.77

As the yield of wood alcohol is small, it would not pay to take it as the only by-product, but in connection with the others, it would not require any extra labor, and with that view of the matter, it makes a very profitable by-product.

As a pulp mill with a daily output of 100 tons pulp can make 300 lbs. alcohol, or say 45 gallons and the price of wood alcohol today is one dollar per gallon, the daily production would amount to $45.00.

Deducting the following expenses:

Power	$ 6.00
Steam and chemicals	2.35
Labor, 1 man	5.00
We have a daily net income	31.65
	$45.00

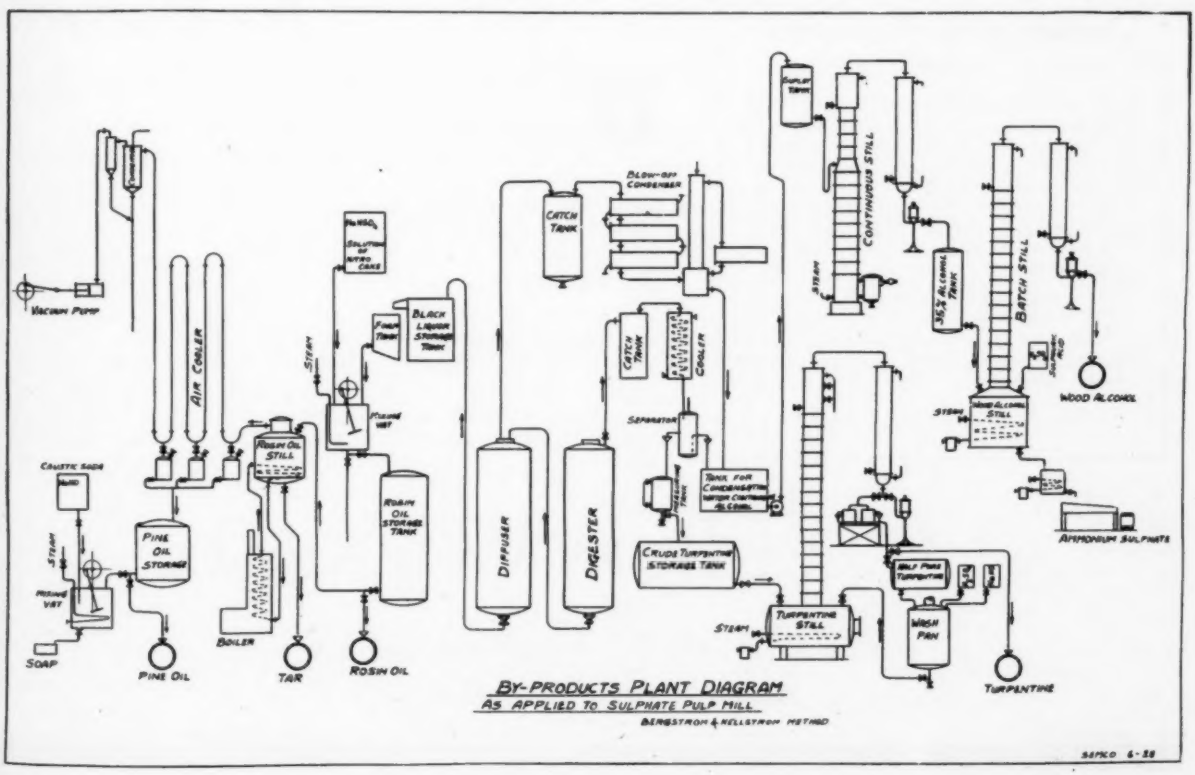
Income per year 300 x 31.65 = $9,495.00.

The second group of by-products are those extracted from black liquor as above mentioned.

We will first take up the rosin by-products which is really taken from the black liquor foam only.

The foam is skimmed off from the black liquor storage tanks and put into a mixing vat equipped with an agitator. There it is mixed with a solution of nitro cake (sodium sulphate $NaHSO_4$). This solution decomposes or breaks up the foam which is really a soap compound, and free rosin oil precipitates. Rosin oil is now separated and pumped to the storage tanks. The residue in the mixing vat which during the reaction turns into sodium sulphate solution is now pumped to the black liquor storage tanks, and utilized in the recovery room.

The yield of rosin oil is 40 lbs. per ton of pulp, and the only chemical used in this process is nitro cake, but as this



View in beater room in large mill equipped with 44 Valley Holland Beaters

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It has been our pleasant experience to receive words of praise and enthusiasm from mills operating this beater on tissue, news, kraft, ledger, linens, bond, book, writing, bristol, photograph, manila, insulating, roofing and board from the higher executive down to the beater men who actually do the work.

It is by this enthusiastic endorsement of its many users that our beating equipment has acquired its position as foremost in the manufacture of paper. The work of the Valley Holland Beater is limited to no particular kind of stock and does the work required with greater economy in upkeep because it is built mechanically correct in its most essential features.

VALLEY IRON WORKS CO.

APPLETON, WISCONSIN

New York Office: 350 Madison Ave.

all goes back to the recovery room with the exception of a small amount which is lost, and is there utilized, it can not be taken into these figures.

This rosin oil is somewhat black in color, but it can be refined into higher grade oils by distilling, using a distilling apparatus similar to the one used for heavy oils.

After distillation, the oil has a light yellow color and a more natural smell. This substance finds a ready market for use in different manufactures but its most important feature is the revolution it has made in the soap industry.

By observing these figures and using the same scale as before we see 100-ton mill can produce 100 x 40 = 4,000 lbs. rosin oil per day.

In distillation, we get 30% in tar and 70% soap producing oil. The 30% or the same volume is added in an alkaline solution, so we have the 4,000 lbs. soap per day, which converted into cash means:

4,000 x 0.7 = $ 280.00
or per yr. 300 x 280. = 84,000.00

The writer has not taken into consideration the manufacturing cost of rosin oil and soap because the exact price of these products in this country he is not familiar with. But from a rough estimate, it is apparent that a considerable profit is obtainable through reclaiming rosin oil and its products in the manufacture of sulphate pulp.

As the by-product question in the sulphate pulp process seems to occupy an important place in the paper world, if this article furnishes any information, or helps to encourage the industry in this country the writer will be very much gratified.

British Correspondence

August 1, 1924.

Paper Trade Situation in Great Britain

Notes on Progress of Paper Trade Exhibit at British Empire Exhibition

Messrs. Cooke and Nuttall have very efficiently carried out the adaptation of the model paper making machine installed at Wembley from printing paper to wrappings. The paper being turned out by them on the exhibition machine is of a very high quality. It is, in fact, being supplied in fulfillment of a contract. The number of business visitors to the paper trade exhibit continues to increase, and among the names recorded in the visitor's book are to be seen those of a large number of foreign paper trade experts, including visitors from Holland, Belgium, Sweden, Germany, India, Ceylon, Australia, Canada, and quite a number from the United States of America.

There has been a suggestion put forward that the model paper making plant shall be preserved for research purposes after the exhibition is over, as, owing to the fact that there is no paper making machine available in London for demonstration purposes for the various trade classes being held in London, and in view of the great interest which the machine is causing, not only among students, of paper making, but among all business men in allied industries, it is felt that something definite might be arranged to preserve this unique exhibit in perpetuity.

Advertising Convention

The Convention of the Associated Advertising Clubs of the World opened on 12th July with a wonderful reception and ball at the Royal Albert Hall at Kensington, at which the British hosts welcomed their American guests. This was presided over by the Right Honorable the Viscount Burnham, supported by the Right Honorable the Lord Leverhulme, and the Lord Mayor of London, the Right Honorable Sir Louis A. Newton, in full robes of office, accompanied by the Lady Mayoress and the civic officers in full regalia.

It is interesting to observe that Lord Burnham is one of Britain's great newspaper owners. He has for many years been chief proprietor of the "Daily Telegraph," a paper which under his direction has obtained a world wide reputation and an enormous circulation.

Associated with the "Daily Telegraph" is the Daily Telegraph Paper Mills at Dartford, Kent, which under the able management of Mr. Philip T. Goldney, who has introduced various improvements in both constructional and selling methods, have met with great success, and may be now ranked as one of the important paper mills of Great Britain.

Other big newspaper owners and executives taking an active part in the convention are:

The Right Honorable the Lord Riddell, vice chairman Newspaper Proprietors' Association.

Sir Andrew Caird, K. B. E., "Daily Mail," London.

Sir James Owen, "Express and Echo," Exeter.

Sir Stanley Reid, K. B. E., "Times of India."

Sir William Berry, Mr. J. Gomer Berry, Berry group of newspapers.

Lieut. Col. E. F. Lawson, D. S. O., M. C., "Daily Telegraph."

Special services were held on Sunday 13th July at Westminster Abbey, Saint Paul's Cathedral, Westminster Cathedral (Roman Catholic), and other well-known places of worship in London, in which the special subject dealt with in the sermons was "Truth in Advertising."

His Royal Highness the Prince of Wales declared the convention open at the welcome sessions held on Monday morning, July 14, in the main Conference Hall of the Palace of Industry in the British Empire Exhibition grounds at Wembley, and as President of the convention extended to the delegates a most hearty welcome.

Raw Material Supplies

Mr. Sheldon Leicester has recently read an interesting lecture before the Royal Microscopical Society on "The Available Supplies of Fiber for Paper Making," which was illustrated by lantern slides and microscopic slides. During his lecture he pointed out that an authority had estimated that by 1928 three million tons of fiber will be required from new sources, and that the demand for paper would increase to nearly sixteen million tons in 1938. Mr. Sheldon Leicester also dealt with the possibility of reutilizing the millions of tons of waste, and among other methods he mentioned the Winestock process, which produces a pulp only a few degrees lower in shade than the original pulp used, and he also dealt generally with the technical difficulties of using large stocks of old paper. Mr. Sheldon also emphasized the importance of giving greater attention to new sources of supply. Raw materials for paper may be drawn in great quantities from many natural sources, and among likely materials he mentioned were maize, oat, wheat, and barley straw, and it is interesting to note in this connection that a modern plant has recently been erected at Java under the auspices of the Dutch Government for the production of fine papers from rice straw.

Mr. Sheldon concluded by suggesting that it was time that the British enterprise should undertake the exploitation of the vast possessions of plant life within the British Empire, and that with the world's demands for paper continuing to advance it was high time for action in this direction.

Developing the Fibre Board Industry in Great Britain

HOW the fiber board manufacturer can coöperate with the builder in producing beautiful and durable exteriors has been very ably demonstrated at the British Empire Exhibition. A very large number of the kiosks and pavilions at Wembley have been constructed of "Ten-Test" Fiber Board, as is also the British Empire Column in the Palace of Industry. The Ten Test Fiber Co., Ltd., of Bristol, have combined with Lapidosus, Ltd., in carrying out the erection of these buildings, the fiber paneling or walls being covered with a stone facing of a material known as Lapidosus.

Lapidosus, a stone facing composition invented by a Bristol man who for many years has been dissatisfied with the ordinary cement coating applied to buildings, and studied the question of how the thing can be done in a much better manner.

It occurred to him that effective use could be made of the large amount of waste material shed in working up freestone for the facings of buildings and other constructional work. After many experiments he hit upon a process which produces a wonderfully strong and attractive stone facing composition. This material, which the inventor has named "Lapidosus," is largely composed of stone dust which, with other materials, is treated chemically. It is applied in mastic form to the face of a building, and afterwards so finished and jointed that it is practically impossible even for an expert to tell it from freestone or Portland stone after it has been finished to resemble either of these stones.

"Ten-Test" is the name given to a pure selected pulped wood-fiber, compressed into sheets. It contains no laminations other than the grain imparted by compression, and is not built up by layers of glued paper but a solid mass of inseparable wood-fibers. National Physical Laboratory tests show that it is equal to cork in heat insulating value, and of sufficient tensile strength to permit of its being bent to nor-

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The Caldwell line of bearings is complete; from the light to the heavy; with approved types of lubrication—plain, grease cup, ring-oiling or collar-oiling.

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There is a standard Link-Belt chain for every service for elevating, conveying or the transmission of power. And, as the durability of the chain depends largely upon the sprocket, we are prepared to furnish sprockets that will correctly fit all chains of standard pitch, and assure the long life of both the chain and the wheels.

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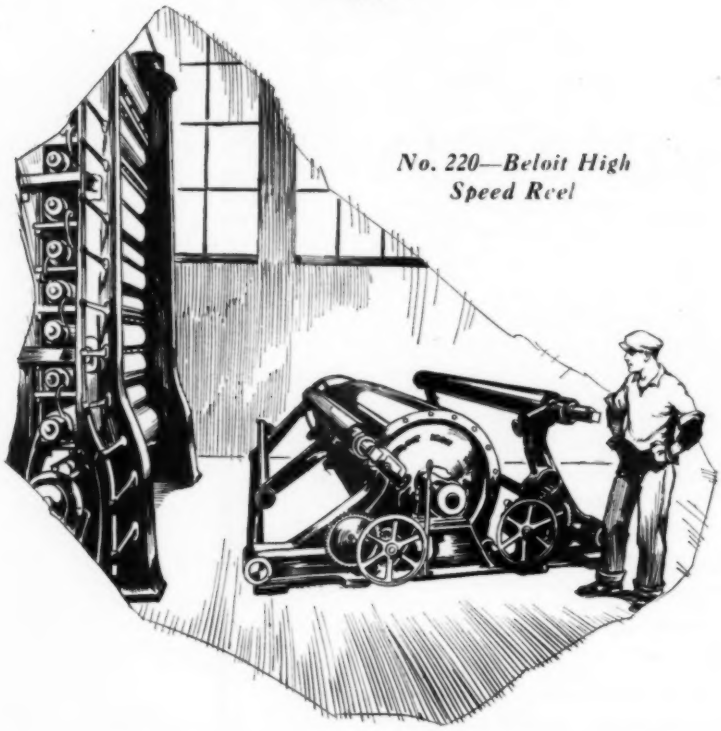

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THE BELOIT UNIFORM SPEED REEL effects a saving of paper every time you change reel drums. It displaces the old obsolete method, and insures steady, reliable performance plus absolute assurance of economy of operation. Furthermore, it entirely eliminates the danger of drawing men between reels of the conventional upright type, effecting a further saving in man power and accident liability. It can be depended upon to wind a beautiful roll that is very uniform in hardness.

Moreover, the extra refinements added to this reel make it much handier than any of similar design. An instance of this is the ease with which paper is started on the drum. The passer does not have to change hands when performing this operation. Its simplicity and ease of operation is a revelation.

Let us know the face of your calender rolls and we will gladly submit a figure covering your particular case.

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mal ceiling, dome, etc., within its elastic limit. It has a matt surface giving very attractive stippled finish.

The "Ten Test" fiber board people are "boosting" this product as an economical all-purpose wall board, which permanently retains beautiful decoration and stucco and as a material which is more or less impervious to weather, vibration, heat, sound, or frost, and suitable for exterior as well as interior purposes.

It is interesting to observe, in connection with the above, the number of paper manufacturers in Great Britain who are developing departments for the manufacturing and marketing of building board of various types. This type of building material is becoming increasingly popular in this country, and a number of the manufacturers are also developing export departments and establishing some valuable connections in tropical and far eastern countries, where climatic conditions make this class of walling eminently suitable.

Other manufacturers are extending in the direction of fiber and woodpulp boards for packing cases, and advertising in national trade media the advantages of using this material for packing case purposes.

The proprietary article manufacturer is being told of the advantages of using the two kinds of fiberboard for packing cases—solid and corrugated. A popular type of packing case is one with wooden frame ends, holding thirty-six one-pound size containers, a sheet of fiberboard being placed between the two layers of containers, with another one covering the top layer. The trays are made removable and easily lifted out by means of tape bands attached. Some of these packing cases have been made in such a way that on arrival at their destination they can be adapted for display purposes, which is a distinct advantage to the retailer, who is thus spared the expense of display fittings, etc.

One style of fiberboard packing case is made extra strong at the ends by means of projecting flanges so arranged as to be fastened to the bottom and sides of the case by rivets or wire stitches. The flaps acting in this way as reinforcement strips.

The paper container itself is again coming into popularity. These with the metal tops and bottoms are a considerable improvement on the war-time products, which sometimes proved very inefficient, and consequently prejudiced manufacturers against their continued use when glass supplies came back to normal. The metal bottoms of the package are now invariably crimped or seamed on to the body, and the types of tops are varied, some being of the cap kind, as in cardboard, and others having seamed edges with a removable lever-lid or a screwed-on lid. They are, of course, also supplied with perforated tops, for sprinkling purposes.

A suggestion has been made by one man in the trade that a standardization of the sizes of paper containers would be a means to a greater economy in production. The establishment of standard sizes would of course mean mass production, which would naturally be followed by reduced overhead charges and a reduction in prices.

British Guiana Woods for Paper Making

THE Imperial Institute of London, England, recently carried out an extensive investigation into the paper making qualities of thirteen specimens of timbers and palm stems, and have published the results in their quarterly Bulletin. The following table gives a summary of their tests:

Bara-bara gave a well reduced pulp which furnished a brown paper of good strength. The pulp bleached satisfactorily and then gave a white paper of good strength and quality.

Baramalli pulp contained a small quantity of hard particles, and yielded a paper of fair strength containing some dark specks. The pulp bleached readily, and then gave a soft paper of good color, fair strength and free from specks.

Haiara-balli gave a moderately strong, rather speckled grayish-brown paper. The pulp bleached fairly readily and furnished a white paper practically free from specks and of moderate strength and quality. In the second test the thin bark was not removed, and the specks were more numerous and did not disappear on bleaching; the pulp bleached to a brownish-cream tint, but the paper darkened somewhat on keeping.

Hubu, or hog-plum, gave a strong brown paper containing a few specks. It required a fairly drastic treatment in bleaching, and then gave a strong white paper of good quality.

Hurowassa gave a pale brown paper of fair strength. The pulp bleached readily, yielding a fairly strong white paper.

Karahora gave a strong pale-brown paper. The pulp bleached fairly readily, and then yielded white paper of good strength and quality.

Kurukoruru gave a soft pale brown paper of fairly good strength, and, after bleaching, a white paper of similar strength.

Long John gave a light pinkish-brown pulp, furnishing paper of fair strength, and bleaching readily and giving a white paper of similar strength.

Wanasoro and manicole were both pulped without barking. In both cases the first test did not disintegrate the wood properly, both unbleached and bleached pulps being full of specks. The second tests gave good paper from both the unbleached and the bleached pulps.

Ite (Aeta) was pulped without barking and gave a soft but coarse-fibered brown paper of poor strength. It bleached fairly readily, then giving a soft cream-colored paper.

Mukka-mukka was pulped without barking. The first test gave paper containing a large number of dark specks even after bleaching; while the second test gave good papers from both the bleached and the unbleached pulp.

The first ten woods are considered suitable for the commercial manufacture of paper of good quality. Manicole would be less satisfactory. And the last two gave too low yields to be of commercial importance.

Botanical specimens of the trees were forwarded to the Royal Botanic Gardens at Kew for identification.

The West Virginia Pulp and Paper Company have purchased what is believed to be the largest book machine in the world. The machine has a wire 210 inches wide, has three presses, 5 foot dryers, two stacks of calenders, a reel and winder, and will run at a maximum speed of about 500 feet. This machine was purchased from Rice, Barton & Fales of Worcester, Mass.

Local Name	Moisture %	Ash %	Cellulose % As received	Cellulose % On dry Basis	Ultimate Fiber Length in mm. Min.	Ultimate Fiber Length in mm. Max.	Ultimate Fiber Length in mm. Av.	Caustic Soda Used Per 100 parts wood	Conditions of boiling: Strength of solution	Conditions of boiling: Time in Hours	Conditions of boiling: Temp. ° C.	Soda consumed per 100 parts of wood	Yield of dry unbleached pulp or wood as received
Bara-bara	13.6	0.6	50.3	58.2	0.5	1.4	0.9	20	4	9	160	14.1	47
Baramalli	13.0	1.2	50.6	58.2	0.8	2.6	1.9	20	4	9	160	13.0	42
Fotui	23.4	0.6	45.1	58.9	0.6	1.3	0.95	20	4	6	160	9.9	46
Haiari-balli	20.2	0.4	40.4	50.6	0.8	2.0	1.3	20	4	6	160	10.4	41
.....	...	...	...	...	...	...	...	20	4	9	160	12.8	36
Hubu or Hog-plum	14.6	1.0	45.9	53.7	0.7	1.6	1.1	20	4	9	160	14.9	40
Hurowassa	35.4	0.9	31.8	49.2	0.5	1.4	0.9	20	4	6	160	9.2	31
Karahora	15.0	0.6	47.6	56.0	0.4	1.8	1.0	20	4	6	160	11.6	49
Kuru Koruru	17.2	0.4	50.4	59.4	0.9	2.0	1.3	20	4	9	160	11.2	41
Long John	16.1	1.2	46.7	55.7	0.5	1.7	0.9	20	4	9	160	13.2	38
Wanasoro	11.8	2.1	54.1	61.3	0.6	1.6	1.1	20	3	9	160	13.3	48
.....	...	...	...	...	...	...	...	24	4	9	160	14.5	47
Manicole	12.0	1.4	45.5	51.7	0.4	2.6	1.2	20	4	6	160	13.4	45
.....	...	...	...	...	...	...	...	24	4	9	160	15.1	40
Ite (Aeta)	13.6	0.6	43.5	50.3	0.8	3.3	1.6	20	4	9	160	12.6	28
Mukka-mukka	13.2	2.2	42.2	48.6	0.6	2.8	1.5	20	3	6	160	12.4	36
.....	...	...	...	...	...	...	...	24	4	9	160	14.5	30

You put rubber on a press roll for a definite purpose

—*to serve as a cushion!*

Yet many rubber covered rolls are so hard that they might almost as well be of wood or metal so far as their effect on the sheet and felts is concerned.

In the past it has been necessary to use hard rolls because ordinary rubber roll stocks, which were soft enough to accomplish their purpose, corrugated so quickly.

Now, the development of "High Speed News," "News" and "Kraft" makes practical the use of softer press rolls, because these stocks do not corrugate as quickly as other rubber roll coverings of the same density.

They give the proper cushion economically.

THE B. F. GOODRICH RUBBER COMPANY
Akron, Ohio
ESTABLISHED 1870

Goodrich

High Speed News RUBBER PRESS ROLLS

"BEST IN THE LONG RUN"

New England News

August 1, 1924.

Summary of the Month

Fires of very serious consequence for the Great Northern Paper Co. and the Penobscot Chemical Fibre Co. were some of the unfortunate results of the dry weather experienced during July. Between 15,000 and 20,000 acres of second growth spruce and fir were destroyed in these fires, the Great Northern's lands near Rainbow Lake, Me., being the heaviest sufferers. That carelessness was responsible for these as well as most forest fires was pretty well evidenced, suspicion pointing in this case to careless smokers.

Generally speaking, however, August opens more auspiciously for New England industry than did July. In some lines it appears as though a mild mid-summer boom had set in, to relieve the monotony which it was expected would last until September. Writing paper mills report an encouraging showing during the past fortnight and the Connecticut valley is absorbing more rags this summer than in any similar period outside of war times. Scarcity of rags which has been evident in this section for months was even plainer when the Writing Paper Manufacturers' Association appealed to the Department of Commerce for aid in preventing a shortage.

Advances of from ½c to 2½c per pound have occurred in certain grades of new cotton cuttings such as white shirts, bleached and unbleached shoe rags, blue overall cuttings and soft unbleached cotton. Old grades, including twos and blues, have been stimulated both by good demand and the second bull movement of the year in roofing rags.

Only the board industry lags behind as is usually the case. August opens in that respect rather gloomily for the largest board mill closes today for at least a fortnight and all others with two small exceptions have idle machines.

New Research Station Studies Management of Northeast's 40,000,000 Forest Acres

In New York and New England approximately 40,000,000 acres of forest land are located which for the future welfare of industry in this section of our country, as well as for the health and well-being of its citizens, must be managed with closest economy and efficiency, states the United States Forest Service. To assist in determining the fundamental facts and principles on which such management must be based, the Northeastern Forest Experiment Station was established. This is one of the two youngest stations of the Forest Service, and is this month completing its first year of service.

Under the guidance of Director S. T. Dana, the station's activities in carrying out its preliminary program of work have largely been centered on problems having to do with the management of the spruce forests. These forests, which are the mainstay of the pulp and paper industry in this section, are found chiefly in the northern part of the region. In this and other experimental work the station is very closely coöperating with other investigative agencies already in the field, such as the forest schools, the agricultural colleges and experiment stations, State forestry departments, botanical gardens, and private companies interested in forest research.

To insure proper correlation and coördination of all who are engaged in such work, the Northeastern Forest Research Council has been organized, its members being appointed by the Secretary of Agriculture on recommendation from various agencies interested. The membership of the council, which will function in an advisory capacity, includes W. R. Brown, president, New Hampshire Timberland Owners' Association; P. S. Collier, secretary, Northeastern Retail Lumber Dealers' Association; J. H. Foster, New Hampshire State Forester; R. S. Kellogg, secretary, News Print Service Bureau; Dean Moon of the New York State College of Forestry at Syracuse; G. W. Sisson, jr., president, Racquette River Paper Co.; H. G. Philbrook, president, Vermont Timber Owners' Association, and Prof. Toumey of the Yale School of Forestry.

The unfortunate financial difficulties, a hangover from wartimes, have involved the Bath Iron Works, Ltd., in suits instituted by the bondholders protective committee looking towards a receivership. The Merrill Trust Co. of Bangor is making efforts to have the company declared in receivership and hearings are set for this month on this motion which will be heard in the court at Bath. Despite these troubles the famous Warren Magazine grinder made and developed by this concern continues to gain in popularity. Three of these huge machines noted for their durability, greater productivity and low upkeep will be built for the Iroquois Pulp & Paper Co. of Saratoga Springs, N. Y., the order being received during the past month. They will be duplicates of the four built by the Bath Iron Works for the Great Northern Paper Co.'s enlarged plant at Madison, Me. Each weighs 95,000 lbs. The company is also turning out special caustic soda decanting apparatus for companies at Tonawanda, N. Y.

Country's Oldest Company Expands

For the second time in three years, important expansion programs have been mapped out by the oldest paper makers in the United States, Tileston & Hollingsworth Co. of Boston, whose mill is at Mattapan with the city limits. They have awarded a contract to the Morton C. Tuttle Co. of 86 Park Square Building for the construction of a three-story rag boiler room and a four-story beater room. Work will be begun at once. George F. Hardy of 309 Broadway, New York City, is the engineer.

Less than a year ago Tileston & Hollingsworth installed in their reconstructed mill a new large Fourdrinier machine built by Rice, Barton & Fales Co. of Worcester. They also completed a new administration building. This company manufactures an extensive line of fine printing papers for the production of which it makes use of not only wood pulp and waste paper, but rags as well. Its new machine has produced some excellent rag printing stock and to care for the processing of the greatly increased volume of rags is one of the reasons the new rag boiler room is required. All three of the company's machines are running.

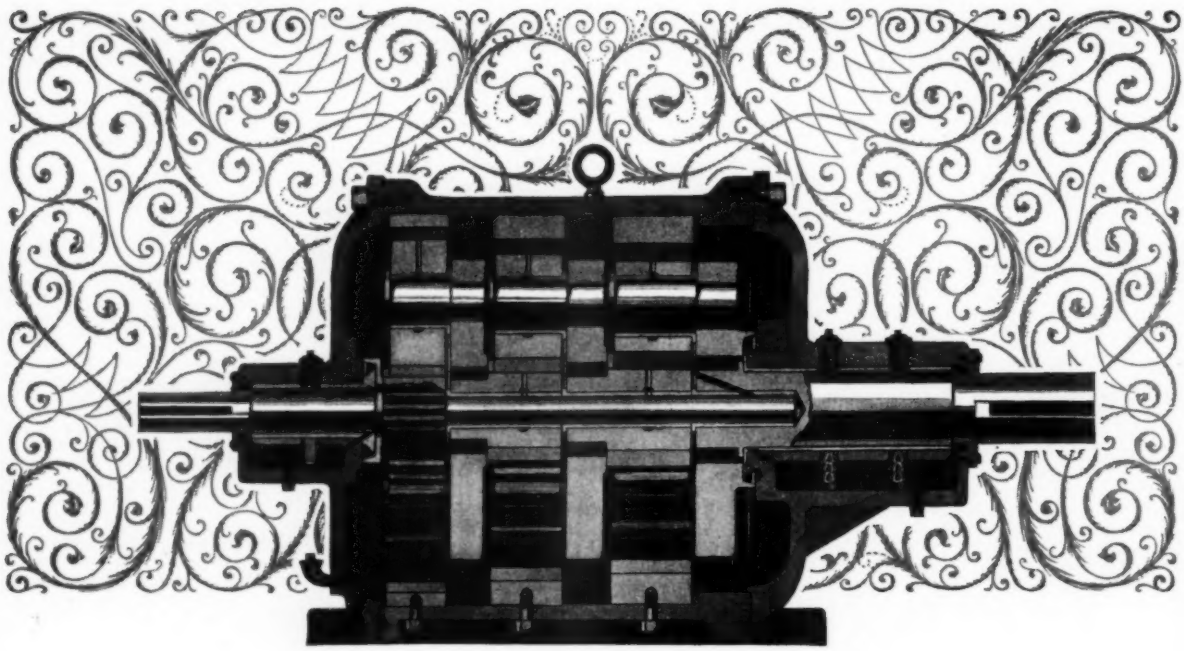
Incidentally the Morton C. Tuttle Co. of Boston, is making great strides as a factor in paper mill construction. Underbidding many competitors they secured the contract for building a new mill at Covington, Virginia, for the West Virginia Pulp and Paper Co. recently. This new structure in Virginia will house the largest book paper machine ever pieced together and it will be made in the foundry and shop of Rice, Barton & Fales, Worcester, Mass., paper mill machinery makers. This new machine will be 250 feet long, 28 feet wide and 15 feet high and will weigh 1000 tons. The order means full time for the Worcester Company over the remainder of the year. Rice, Barton & Fales, after completing this machine, will hold two production records for a year ago they completed the largest kraft Fourdrinier in the world for the Southern Paper Co. of Moss Point, Miss.

Court Sustains Exceptions

The Supreme Court of Massachusetts has sustained the exceptions of the plaintiff, the Nashua River Paper Co. in its case versus Edwin P. Lindsay which was decided in the lower court favorably for the former with a damage award of $40,000. The case involved sale of a large quantity of "Kraft pulp suitable for the manufacture of No. 1 Kraft paper." It was clearly proved in the Superior Court that the pulp was not of this character and was generally inferior.

However the lower court judge held that only a part of the pulp had been clearly complained of in a manner to indicate that the buyer did not waive his rights as to quality. This the Supreme Court dissented from, and the case will in all probability come before the lower court again, with the chances that a greater verdict will be allowed. The pulp was shipped from Howland, Deerfield and Van Buren mills. Edwin P. Lindsay is president of the Advance Bag & Paper Co.

One of the most serious labor troubles in New Hampshire in years is threatened as a result of the strike in the paper and pulp mills of the Parker Young Co. at Lincoln, N. H. The company declared for a 5c per hour reduction in wages which was refused and the union ordered a walkout at the mills on July 1. Since then the union has offered to arbitrate accepting the 5c reduction but demanding recognition of their organization. The company thereupon declared for the open shop in the future and added that employes not returning to work would always be barred from employ. Inasmuch as they own tenements in which over 400 of the strikers live they threaten evictions for nonpayment of rent. The company recently reopened the mill offering employment to those who returned under the new conditions but only 17 accepted. The threatened violence to these men and the company's property has not yet occurred.



Compact Efficiency

JAMES SPEED REDUCERS have demonstrated their mechanical efficiency in thousands of installations.

But where space is an essential factor in the selection of power transmission equipment, James Speed Reducers make a further contribution to general plant efficiency in that they occupy the minimum of space for the horsepower transmitted.

They require very little attention and *no* adjustment, and may be tucked away under the floor, upon the ceiling, or within the space occupied by the machines which they drive.

The Speed Reducer is not the only method of power transmission, but it is the most compact, the most efficient and practical.

The D. O. James Manufacturing Co.

1114 W. Monroe St., Chicago, Ill.

Manufacturers also of

Spur, Bevel, Mitre, Worm, Internal, Helical and Tractor Gears.
Rawhide and Bakelite Pinions—Racks.

33

D.O.JAMES

C. L. Whittemore, traffic manager of the New England Paper & Pulp Traffic Association, represented his organization at the Washington hearings during the past month when the West Virginia Pulp & Paper Co. presented its case for lower rates to leading consuming points from its various mills. Mr. Whittemore intimates that should success crown the West Virginia company's efforts the New England mills will insist on similar treatment. Mr. Whittemore expects drastic reductions in the rates from New England to trunk line territory on all grades of paper when the Interstate Commerce Commission has completed its investigation of these inter territorial class rate structures. Present rates, New England to trunk line and Central Freight Association territory are hauled on old sixth class. New sixth class structure would mean substantial declines all around. Railroads would be recompensed according to Mr. Whittemore by advances on less carload and high class traffic.

The Great Northern Paper Co. has coöperated with the University of Maine in extending that institution's famous paper making courses into the realm of actual forestry practice. A camp at Rainbow Lake was established through the assistance of Fred A. Gilbert, vice-president and general manager of the Great Northern. Here field work is given in the mapping, cutting, hauling, camp construction, log scaling and inspection work under the supervision of company men. D. B. Demeritt instructor in Forestry at the university has been in general charge of the camp. Those who participated will be given credit towards their degrees in the paper making courses. The University of Maine was the first institution of collegiate grade to develop major courses in paper.

Further effort by the Boston & Maine Railroad to corral wood pulp business is seen in another reduction on wood pulp import rates through Boston, the reduction this time being to Lockport, N. Y., previously on a 25c basis now 22½c per hundred pounds equal to Philadelphia or New York. Strong protest from the Mt. Tom Sulphite Co. is expected, also from Brown & Co., who still have 25c rates to practically all the important New York state consuming points. A commodity rate reduction on paper in carloads, which normally moves sixth class is made by the Boston & Maine from Berlin, N. H., to North Tonowanda, N. Y. The new rate is 28½c per hundred pounds.

An outing attended by over 1000 persons held on the grounds of the Hollingsworth & Vose Co. at East Walpole was an unusually enjoyable affair. Over 300 came in auto busses from the company's East Walpole mill, while 100 motored from Boston. Keen rivalry was displayed between the contestants of the two mills in the departmental trials which included loading of wood pulp, sorting of old rope stock, shoveling of coal into boiler shaped boxes and hose coupling. The annual ball game was snappy and interesting despite the 7 to 1 score in favor of West Groton mill. A banquet was served in a huge circus tent, in the evening followed by dramatics and dancing.

The Canadian Realty Co., Ltd., and the same company Inc., the former a New Brunswick and the latter a Maine organization, have appointed representatives to be present at the conferences with officials of the International Paper Co. These companies bought pulpwood for the International Paper Co., the former in New Brunswick and the latter in New Brunswick and Maine with headquarters at Calais. Both companies have become bankrupt through the drop in pulpwood prices. They expect to make arrangements with the International officials that will enable them to continue operations.

Word was received by the New England Paper & Pulp Traffic Association this month that the examiner had refused to approve the decreased rates from the middle states paper making districts to the Pacific coast. These rates were very strongly opposed by the association which includes the leading New England book paper mills in its membership. At these hearings it also represented the Holyoke fine paper makers by special request. The rates desired by the westerners would have put their overland all rail tariffs on a parity with the New England rail and water via Boston and the Panama Canal.

William Whitcomb, 1st vice-president of the Great Northern Paper Co., is in Europe on an extended vacation and will return the end of August. While abroad it is expected that he will spend some time in the observation of methods employed in northern European mills. The Great Northern Paper Co. has manifested considerable interest in the forestry practice in Germany and the Scandinavian countries.

The Presumscot Electric Co., a subsidiary of the S. D. Warren Co. of Cumberland Mills, Me., having sold all its commercial electrical business will cease to operate as an independent company and will in the future be conducted as a division of the paper mill for purposes of supplying the latter with power.

In a test case the Massachusetts Supreme Court will decide whether the city of Haverhill can contract with one company for the exclusive collection of waste paper in the city. The Priestley Paper Co. has brought suit against the city.

The work of constructing a substantial storehouse for the Crocker Burbank Co. Assn. of Fitchburg, Mass., is well under way. It is located on the corner of Westminster Hill Road. The contractors are Wiley and Foss of Fitchburg. It will be wood construction, two stories in height.

The Hollingworth J. Vose Co.'s orders on wire rope paper will keep its mill on full time until early winter on the basis of orders now on its books.

New York City News

August 1, 1924.

Wood Pulp Importers Incorporate

The firm of Ira L. Beebe & Company, wood pulp importers, has been incorporated under New York State laws with a capital of $500,000, and a consolidation of the company and the wood pulp importing department of H. Hollesen, Inc., of New York, has been announced. Ira L. Beebe, Jr., is president of the new corporation, H. Hollesen, vice-president, and Roderick Beebe, the son of Ira L. Beebe, Jr., is secretary.

New offices have been established in suite 1440-42 of the Whitehall Building, 17 Battery Place, New York, the old firm of Ira L. Beebe & Company having removed from 132 Nassau street, and the firm of H. Hollesen, Inc., having removed from 44 Beaver street. Associated with the new pulp firm are Edward W. Bedford, well known in the pulp trade through his connections with several leading concerns, and Harry W. Droudt, formerly western representative for Bulkley, Dunton & Company, of New York, who will cover the Middle West as sales representative for Ira L. Beebe & Company, Inc.

The new firm will act as agents in the United States for the sulphite output of the Kinigsberg and Nordeutsche pulp mills, both located in Konigsberg, Germany, and both producers of Mitscherlich sulphite, widely known and long used by American paper manufacturers. The concern will also import Scandinavian pulps, having established offices in Christiania and Stockholm.

Ira L. Beebe & Company are reputed to be the oldest concern in the wood pulp trade in New York City. Founded in 1851, it has long held a prominent position in the trade, and in the 73 years of its existence has brought in thousands of tons of pulp from abroad. Ira L. Beebe, Sr., has retired from active business and the new corporation is under the direct management of his son, Ira L. Beebe, Jr.

American Baltic Corp. Elects New Officers

Announcement is made of the election of Ralph Bretzner as vice-president and secretary of the American Baltic Corporation, wood pulp importers of 10 East Forty-third street, New York. Mr. Bretzner, who is interested in the company as a stockholder, will have charge of the concern's foreign and domestic wood pulp transactions. Mr. Bretzner, formerly sales manager of the Becker Woodpulp Company of America, Inc., 501 Fifth avenue, New York, brings to the American Baltic Corporation organization a very complete knowledge of an experience in the manufacture of wood pulps in the Scandinavian countries and of the sale of pulp to the paper mills in the United States. He sailed for Europe on July 26 to visit the foreign concerns which the American Baltic Corporation represents in the United States.

Siguard Sorenson, who has for many years sold wood pulp of Scandinavian manufacture to the paper mills in the United States, has been retained by the American Baltic Corporation as its traveling representative among the paper mills. Josef Westlund, who came recently to this country from Sweden,

THE JOHNSON FRICTION CLUTCH

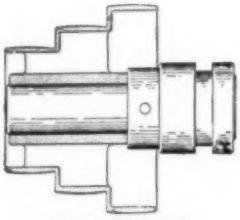
Drive Your Paper Machinery With Johnson Friction Clutches

Single clutch exterior

Double clutch exterior

A QUALITY PRODUCT

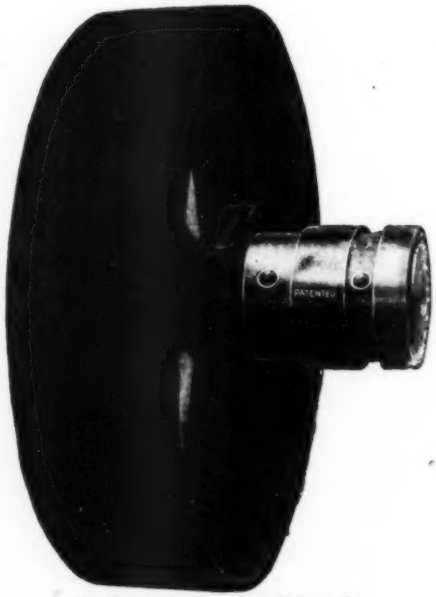
Dependable



Single clutch with cone pulley

Durable

Single clutch with spur gear

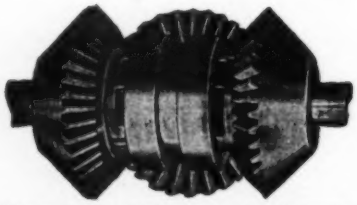


Single Clutch With Steel Split Pulley Mounted on Hub

Efficient

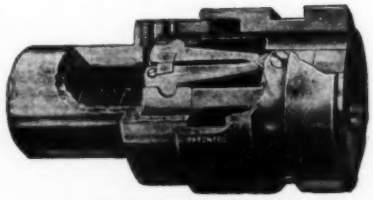
Reliable

BE SURE IT'S A JOHNSON



Johnson double clutch between bevel gearing

Write for Catalog P. I.



Single clutch, sectioned

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

is in charge of the office organization of the company. Walter Meigs remains as president of the corporation.

The Marx Maier Paper Mill Supply Corporation, recently organized and incorporated under New York State laws, will shortly open an office in New York City under the direct management of George M. Graves. The officers of the new corporation are George M. Graves, president; Marx Maier-Herrmann, vice-president; Albert Eckert, treasurer, and Warner Pyne, secretary. The company will conduct a business of importing cotton rags and other papermaking materials from Europe. Announcement regarding the location of the office will be made later. Mr. Graves is well known as the head of the George M. Graves Company, Inc., Boston, Mass., importers of papermakers' supplies, which firm is the representative in the United States for the Marx Maier interests in Mannheim, Germany.

Earnings of the International Paper Company will not compare so favorably in the second half of 1924 with those of the first six months, according to a statement made several days ago by President Graustein, who pointed out, however, that preferred dividends had been earned in the first half of the year. Mr. Graustein said that the reduction in the price of the news print from $75 to $73 a ton and the fact that water power conditions were less favorable in the last six months of the year would tend to reduce profits. He added that he was unable to account for the marked rise in the company's securities on the New York Stock Exchange recently.

William Wacht, of the Waste Material Trading Corporation, importers of papermaking rags, of 135 Broadway, New York, returned from a six weeks' business trip to Europe early in July, and stated that he found rags exceedingly scarce throughout Europe, with dealers abroad in a position where they could hold out for high prices. Offices of the Waste Material Trading Corporation have been moved from the fourth floor to rooms 1101-2 on the eleventh floor of the same building.

Joseph F. Keene, of Katzenstein & Keene, Inc., importers of papermaking rags, of 50 Church street, New York, returned from Europe on July 19, and reported that never in his experience had he found supplies of rags so light in all the European countries. Mr. Keene stated that the last movement of rags to the United States completely cleaned the European dealers out of stock, and that they were accumulating new supplies very slowly owing to the impoverished condition of the people and the consequent wearing of clothes longer than ordinarily.

M. Gottesman, of M. Gottesman & Company, wood pulp and paper importers of 18 East Forty-first street, New York, returned on July 21 from an extended tour of Europe.

Walter R. Hicks, of Daniel M. Hicks, Inc., dealers in and importers of papermakers' supplies, of 200 Fifth avenue, New York, spent most of July on a vacation at Shleter Island, N. Y.

Alex J. Pagel, president of Pagel, Horton & Company, wood pulp importers of 347 Madison avenue, New York, and president of the Association of American Wood Pulp Importers, sailed for Europe on the steamer Drottningholm July 12 for a several months' trip. He was accompanied by Mrs. Pagel, recently a bride.

Norman W. Wilson, vice-president of the Hammermill Paper Company, Erie, Pa., and also vice-president of the American Paper and Pulp Association, who sailed from New York for Europe about two months ago, returned on the steamer Majestic July 16 after visiting Germany and the Scandinavian countries.

J. Warren Wiley, who represents in the metropolitan district the Smith Tablet Company, Inc.; the Kilgore Manufacturing Company, and the Niagara Envelope Manufactory, has removed his offices from 225 Fifth avenue to room 1007 in the Fifth Avenue Building, 200 Fifth avenue, New York.

The American Wall Paper Company, of 16 East 116th street, New York, filed schedules in bankruptcy on July 7 showing liabilities of $12,609 and assets of $1,861. The

Ganschow Gears

Reorder Them by Number

Have you ever ordered a gear—one that was needed to repair a serious breakdown—only to find when it was received, that there was an error in some specification, pitch, bore, number of teeth, or some other detail? Have you?

How much is it worth to you to know that any Ganschow gear that you order for replacement or duplication will be identical with the old one?

Realizing that assurance of correct specifications means a great deal to the operator, that certainty means satisfaction to everyone, the William Ganschow Company is giving insurance against errors with every gear.

Every Ganschow Gear is stamped with the Ganschow trademark, but it *also* bears a record of the production number and date of manufacture.

This simple numerical marking assures absolute conformity to original specifications in manufacture of all gears for replacement or duplication and effectively guards against errors which are so easily made.

The Ganschow Type "B" Speed Transformer is applicable to drives where conditions of space or machine construction demands an angle drive. It is built in a wide range of ratios.

Ganschow Speed Tranformers are also made for Direct Drive and Vertical Drive.

"There's a Type for Every Service"

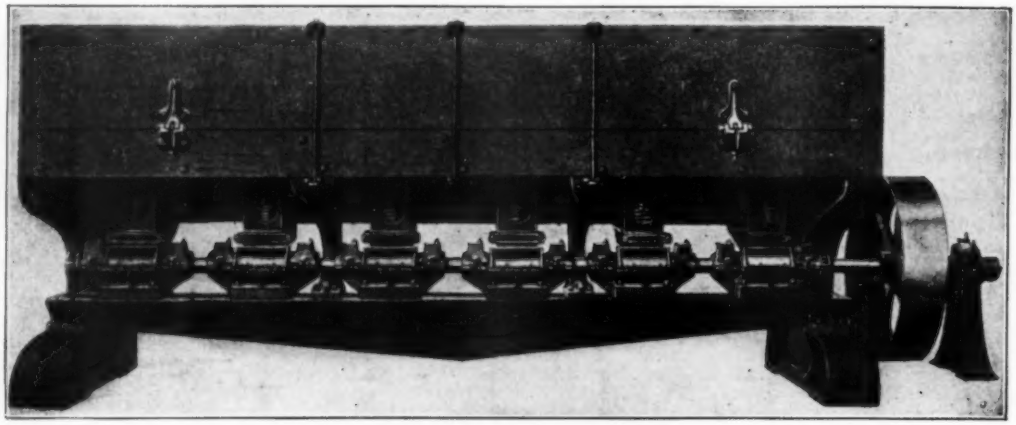
William Ganschow Company

1011 Washington Boulevard
Chicago, Illinois

MEMBER A.G.M.A.

Manufacturers of
Cut Gears and
Speed Transformers

Pulp and Paper Mill Machinery



FLAT SCREENS
Made in **All Sizes from 6 to 18 Plates Inclusive**

Grinders

Three and Four Pockets

Equipped with **all Latest Devices** including our **Patented Pulp Scraper between the pockets.**

Inquiries Solicited

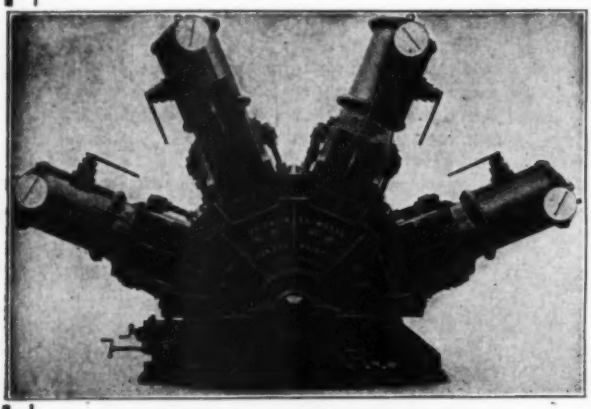
Chippers

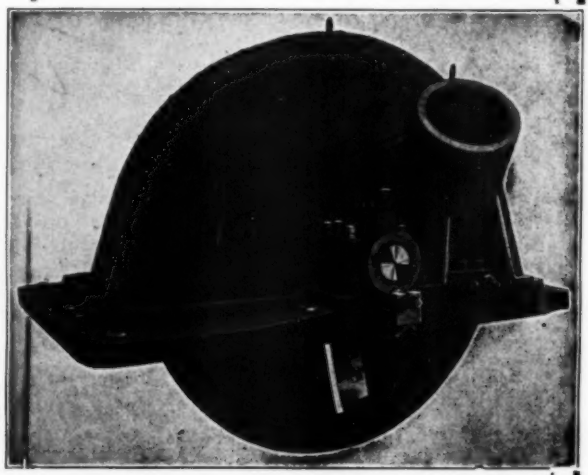
Made in 48″, 84″ and 90″ sizes, right or left hand; three or four knives.

The 48″ chipper is intended for small wood or slabs.

Our patented improvements make the production of clean, evenly cut chips, free from slivers, possible.

Description on request





We also manufacture Cylinder Molds, Wet Machines, Barkers, Pumps, Iron, Brass, Bronze and Lead Castings

Union Iron Works, Bangor, Maine

principal creditors were the Lennox Wall Paper Company and the Manatau Wall Paper Company.

The Salesmen's Association of the Paper Industry is holding a monthly luncheon during the summer months instead of the usual weekly get-together. The July luncheon was at the Hotel Belmont on July 14 and was well attended.

S. Schapiro & Sons, paper stock packers of Baltimore, Md., have opened a branch office in New York at 38 Park Row, with Harry Rosenberg, well known in the trade here through his connections with several leading concerns, in charge.

J. A. Miller, vice-president of the Scandinavian Pulp Agency, Inc., 342 Madison avenue, New York, left early in July for a three months' business trip to Europe.

Pacific Coast News

August 1, 1924.

Director Appointed for New Pacific Northwest Station

The Forest Service has just announced the appointment of Thornton T. Munger of Portland, Oreg., as director of the new forest experiment station to be established this summer in the Pacific Northwest. Mr. Munger has for the last three years been in charge of the Forest Service timber sales from National Forests in Oregon and Washington. His work with the service dates from 1908, when he received his first appointment as forest assistant in this region. In all, Mr. Munger has spent eight years directly in research work, and is the author of several bulletins upon forest subjects, the principal ones covering the growth and management of two of the most important timber trees of this region, the Douglas fir and the western yellow pine.

The Pacific Northwest Forest Experiment Station, to which the newly appointed director goes, is the most recent extension of the plan of the Department of Agriculture to establish forest experiment stations in each of the important forest regions of the United States, to study the necessary means to protect and perpetuate our timber supplies.

Large extension plans are assured by the Inland Empire Paper Company at Millwood, a few miles from Spokane's business center, with notification recently of an issue of first mortgage bonds of the company being prepared by the Union Trust Company. Details of the issue have not been made public. W. E. Rosebush, manager of the company, declared matters were in the hands of the Union Trust Company.

A party of engineers have left Vancouver, B. C., to examine four sites in British Columbia for the purpose of erecting a pulp and paper mill to supply needs of the Vanderbilt chain of newspapers in California. This was announced by Cornelius Vanderbilt, Jr., millionaire publisher of several pictorial papers in the South.

At Victoria, B. C., the plant of the Whalen Pulp and Paper Company at Port Alice on Quatsino Sound is resuming production operations. At a cost of $1,500,000 a new power plant is to be installed which will involve the construction of a tunnel through the mountains to Victoria Lake, near Quatsino Sound.

Vancouver, Washington's, new $2,000,000 paper mill owned by the Columbia River Paper Mills is scheduled to commence operation the last week in July. The plant will begin manufacturing wrapping paper, vegetable parchments and onion skins. The company also has a lumber mill for its use.

The Pacific Paper Products Company has been incorporated at Seattle for $140,000. The incorporators are A. F. McIntosh, William O'Brien, and Hugh McDonald.

The Pratt Paper Company of Seattle, has been incorporated for $10,000. R. H. Pratt, W. J. Pratt, and W. E. Pratt are the incorporators.

The Washington Pulp and Paper Company, Port Angeles, reports that it has sold its output eighteen months in advance.

James Steenbock, paper manufacturer from Chicago, was a business guest of Seattle during the month.

STEEL
for Immediate Shipment from Stock

For Maintenance, Construction and Repairs

Bars	Boiler Tubes
Shapes	Boiler Fittings
Structurals	Corrugated Sheets
Rails	Concrete Reinforcing
Plates	Welding Rods
Sheets	Babbitt Metal
Rivets	Tool Steel
Bolts	Bar Iron
Nails	Refined Iron
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Shafting	Machine Tools, etc.

Write for the Ryerson Journal and Stock List —the "Key" to Immediate Steel

JOSEPH T. RYERSON & SON Inc
CHICAGO ST. LOUIS CINCINNATI DETROIT BUFFALO NEW YORK

SIMONDS
Barker and Chipper Knives

The best knives for Pulp Mills. Made of the finest edge-holding steel, skillfully made and tempered right to withstand wear.

Write for Catalog and Prices

Simonds Saw & Steel Co.
Fitchburg, Mass. Chicago, Ill.

"TOLEDO" No. 1A—

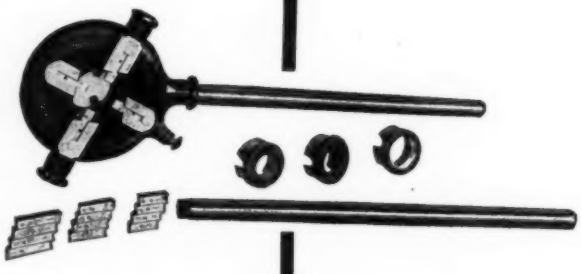
The 1″ to 2″ Threader that Reaches Every Corner Job

This "TOLEDO" No. 1A tool is an ideal pipe threader for the paper mill. It operates with a ratchet, works remarkably easy, and will reach the most inaccessible corner job.

It produces smooth, perfectly tapered threads that insure tight joints.

It has no complicated parts, is sturdily built, yet weighs less than 18 pounds as it is picked up and put on the pipe. It is a tool that will pay for itself in a short time about the mill.

Your jobber will tell you more about this tool of proven worth, or drop us a card for particulars and complete catalogue.



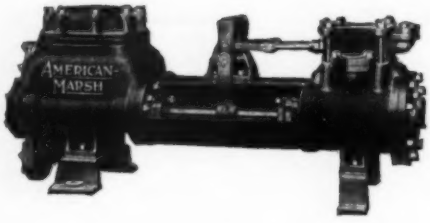
"TOLEDO"

THE TOLEDO PIPE THREADING MACHINE CO. TOLEDO, O.

New York Office, 50 Church St.

AMERICAN-MARSH PUMPS

SIMPLEX—DUPLEX—CENTRIFUGAL

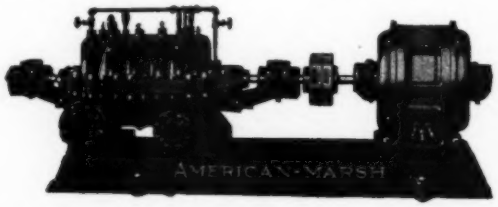


ALL American-Marsh Pumps, whatever the type, are heavily constructed with the best of material and workmanship. They are the result of over 35 years' experience in the building of high grade pumping machinery. Every pump is given a thorough test under actual working conditions before shipment.

There are over 165,000 in successful operation.

The line includes:

Boiler Feed Pumps
Suction Box Pumps
Wet and Dry Vacuum Pumps
Air Compressors
Bilge Pumps
Condensation Pumps
Centrifugal Pumps
Paper Stock Pumps



Write for bulletin covering type in which you are interested

AMERICAN STEAM PUMP COMPANY

BATTLE CREEK, MICH.

Canadian Section

August 1, 1924.

"Canada Counts"

The feeling seems to be growing in London that the principal object of Canada's participation in the British Empire Exhibition is to show that "Canada Counts." The Canadian Pavilion is perhaps the only display where the visitor is not pressed, or at least given the opportunity to buy, buy, buy.

The Canadian Building is a dignified, beautiful, and interesting exhibit of natural resources, scenic attractions and industrial products. The Pulp and Paper Exhibit in the Canadian Pavilion is coming in for its share of attention, and many visitors from foreign countries stop to examine it.

Long-Awaited Pulpwood Report Forthcoming

Our surmise to the effect that "the chances are extremely slim that the report will be laid before Parliament at the present session" has turned out pretty close to the truth. The report was tabled in the House of Commons by the Prime Minister on the 19th of July, just before prorogation. When the Prime Minister moved that it be printed, Right Honorable Arthur Meighen, leader of the opposition, suggested that printing be dispensed with, as nobody would ever read the report now.

The work of this commission, which has already cost the country $77,000, exclusive of the cost of printing the report, is very disappointing, doubtless as much to the government as to the public. The report concludes by saying: "Owing to many intricacies involved in the pulpwood export question; in the complications as between forest conservation and trade relations; in view of the fact that the character and extent of the restrictions would necessarily depend on the extent to which the government might otherwise go in for conservation; finally, as the facts have been very plainly and fully laid before the government, the commission takes the view that the actual determination of a policy must rest with the government."

It is quite easy to see throughout the report that the commission does not favor the imposition of a general embargo. It does, however, say that something should be done to prevent the further rapid depletion of balsam and fir, and apparently an embargo on such exports is not opposed. It is admitted that the pulp and paper industry has undoubtedly been stimulated through the imposition of provincial embargoes. At the same time the unmistakable trend of the report is to the effect that the ordinary measures of forest conservation rather than an embargo would be more effective for the protection of forest wealth.

An unsatisfactory feature of the report is the reluctance of the commissioners to state conclusions in definite language. In almost every case a roundabout way is taken to get to a point. It is this lack of definiteness that deprives the report of the value which it should have, and which the government and public had a right to expect from such an expenditure of money.

Spanish River's Splendid Showing

What will probably prove the most brilliant of the 1924 crop of annual statements by locally listed industrial companies is that of Spanish River Pulp and Paper Mills, which will be forthcoming around the middle of September. Shareholders will have ample grounds for gratification in an exhibit which will show net profits of around $3,500,000 as compared with $2,183,417 last year, with working capital of approximately $10,000,000, with no indebtedness to the banks (there was a bank loan of $1,000,000 last year), and with a surplus of six and one-half millions as compared with $4,485,000 last year. After the payment of preferred dividends there will remain applicable to common shares over two and three-quarters millions, or nearly 30 per cent. Funded debt decreased by about half a million dollars during the year.

Spanish River's advance in the past few years has been a remarkable one, reflecting the sort of administration which brings joy to shareholders. Forced to finance its expansion under difficult circumstances, which set pessimistic heads wagging, the company, nevertheless, was able a little later to meet such a trying period as that of 1921-22. Dsepite the so-well-remembered conditions of that period the company disappointed hosts of calamity howlers and came through with dividends earned and paid, and with added strength for future operations.

The year 1922-23 was a good one for the company, which gathered further strength, and the fiscal year that has just come to a close has placed the company in a position to rank with the foremost industrials of the country. It has improved its position as to limits to an extent not realized by the public, and has inaugurated a policy of conservation and replenishment of these limits with a view to assisting the natural reproduction of wood and obtaining a sustained yield. The company also has freehold land holdings of great value.

Altogether, the company is in a position to face with equanimity even the worst situation pictured by the pessimists of the newsprint industry.

Canadian-Finn Treaty Held Up by Senate

Shortly before prorogation of Parliament, the Senate refused to approve of the proposed trade arrangement between Canada and Finland, and this will have to wait till the next session of Parliament. The confirmation of the proposed arrangement was deferred when the bill was in committee. Senator Lorne Webster moved that the committee rise, and the motion was carried by 33 to 5. Under the rules of the Senate the discussion cannot be revived during the same session.

Great Britain has entered into a trade arrangement with Finland, of which Canada can take advantage, but it must first be sanctioned by the Canadian Parliament, and it was this sanction that was sought in the bill before the Senate. Senator Dandurand, Government leader, said the only objection to the proposed agreement came from the kraft paper manufacturers; but since we were exporting $3,000,000 worth of this paper and selling it in the markets of the world, and Finland was only exporting $2,000 worth of the same paper to Canada, he thought that the manufacturers had little to fear. The duty on kraft paper coming into Canada now is 25 per cent, while under the proposed treaty it would be reduced to 20.25 per cent, which he considered too slight a reduction to seriously interfere with the protection the kraft manufacturers enjoy.

Senator Webster said no opportunity had been given the Canadian paper manufacturers to discuss this treaty with the Government. The kraft paper business in Canada was in serious condition and was suffering severely from Scandinavian competition. Competition from Finland would be even more serious under this trade arrangement. This treaty would jeopardize millions of dollars invested in the paper business in Canada, and might force many factories into liquidation. He thought no harm would ensue if confirmation of the treaty was deferred until the Government and the manufacturers had a further opportunity to consider the matter. He therefore moved that the committee rise, and this was carried.

Improvements at Powell River

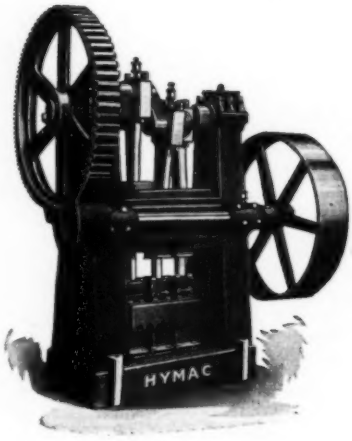
Armstrong, Morrison & Co. are making good progress on development work whereby the capacity of the Powell River Paper Co.'s mill will be greatly increased. The work entails the driving of several thousand piles, the construction of a pier and warehouse and a large amount of dredging. A great deal of the clearing prerequisite to the preparatory work has already been accomplished. Material is being rapidly assembled so that the work may be pushed ahead without loss of time. Much of the machinery and equipment necessary is already on the ground.

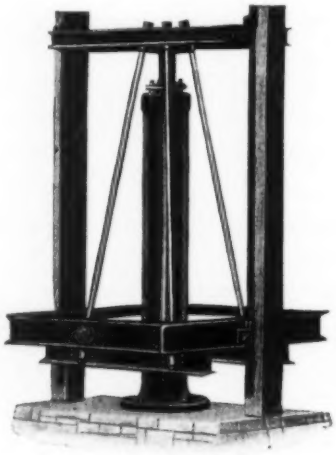
The old head gates at the dam have been removed and stored temporarily along the east bank of the canal, while three new gates for No. 4 penstock are already in position. The new gates for the existing penstocks are made and will be installed shortly. The work of removing the old thimble in No. 4 penstock and replacing it with one of larger diameter has been completed and this will provide for further extension in the future, if required.

GENERAL HYDRAULIC EQUIPMENT

PUMPS

OUR heavy duty TRIPLEX POWER PUMPS are built in sizes from 4" to 14" stroke for pressure up to 6000 pounds. Provided with pulley for belt drive or sub base, gears and pinion for Direct Connection. A high class heavy duty machine for hard service.



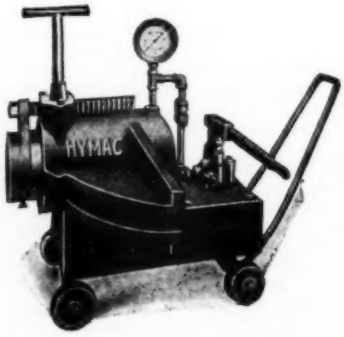


ACCUMULATORS

THE illustration shows the type of ACCUMULATOR accepted as "Standard" in the pulp mill. It is provided with automatic safety control levers and valves. We build several other styles in sizes up to 18" diameter cylinder 15' stroke for any pressure desired.

FORCING PRESSES

EVERY mill requires a FORCING PRESS of some type — our range of styles and sizes is large. The portable type as illustrated is built in sizes from 50 to 300 Tons. The stationary type may be provided in all sizes up to 600 Tons pressure. Straight or inclined.



THE HYDRAULIC MACHINERY CO. LIMITED

MONTREAL, QUE.

Canadian Section

Excavation on the east and west sides of the forebay is practically complete. The forms have been constructed and concrete is being poured. The remodeling of the existing forebay and dam structure will require about 16,000 cubic feet of concrete on account of the increased pressure due to the increased height of the dam. The steel sheeting to be used in the 400-foot core wall is about to be assembled for use.

The projected wharf will be a massive structure of wooden piling which will entail the dredging of not less than 50,000 cubic yards of material. Of this, 20,000 cubic yards have already been taken out, part of which has been used in building the stabilizing fill upon which the new pier will rest. In all, 2,500 creosoted piles will be driven for the pier before the commencement of the construction of the warehouse. The latter will have a capacity more than sufficient to take care of the increased output after the extensions are completed.

Eddy Co. Modernizing Its Hull Plants

The plans for the extension of the E. B. Eddy plants at Hull, P. Q., are taking definite shape, surveys being now made preparatory to the beginning of actual construction work. Plans involving the expenditure of between $2,000,000 and $3,000,000 have been approved by the directors.

The construction work is to be done by Anglin-Norcross, Ltd., of Montreal, and the contract calls for the employment of unskilled labor in Hull; so that labor of that district are practically assured of steady employment until May 1, 1925, by which time the contracts must be completed.

The newsprint and sulphite outputs will both be doubled, being brought up to 100 and 60 tons a day, respectively. The present sulphite mill will be entirely renovated, only a portion of the present machinery being used. Present plans call for the installation of three digesters, but the units will be so arranged that additional digesters can be installed if and when required.

Both the newsprint mill and the sulphite mill will be served by a large central heating plant. A private standard gauge railway will connect the upper and lower mills, and it will be paralleled by a double pipe line for the purpose of economically transferring raw materials.

Among the new machinery will be four large drum barkers, two of which will be situated in the groundwood mill while the other two will be at the sulphite mill. A new 234-inch Walmsley paper machine with Harland sectional electric drive, similar to Price Bros.' Nos. 6 and 7 machines, will be installed. The increased capacity of the mill will necessitate an increase of personnel from about 1,400 to 2,400.

The company has also spent considerable money in openarranged that additional digesters can be installed if and planned to float the logs direct to the mills at Hull.

The company had announced some time ago that the match factory would likely be removed from Hull, but now asserts that, following the agreement with the city regarding assessment for municipal taxation purposes, the plans have been changed and that the factory will remain there.

Trade Treaty with Australia Being Prepared

The news that the governments of Australia and Canada are again communicating with each other with a view to concluding a new trade treaty is received with much satisfaction here.

The attitude of the Australian government with respect to trade with Canada has been a rather puzzling one during the past year. Both Sir George Foster and Hon. J. A. Robb have visited the Commonwealth in the interests of trade, but neither had as much success as it was hoped might attend their efforts. Canada appeared to be willing to go half way on a preferential arrangement, but for some reason or other Australia seemed to hang back.

Of all Canadian industries, the newsprint industry is probably the most interested in the progress of the negotiations now being conducted. The preference which was granted to British newsprint a few years ago, and which was denied to Canada, hit the Canadian industry very hard, and there is much natural eagerness to get back this market. This is especially true now that the export market for this product has been narrowed almost entirely to the United States. It is taken for granted that if a new trade treaty is negotiated it will provide special treatment for newsprint.

As already announced in these columns, A. L. Dawe of the Canadian Export Paper Co. has been in Australia for some time. Another emissary of importance is Sir John Willison, one of the most talented speakers and writers in Canada. Reports indicate that the combined results of their efforts have been favorable.

Such a broadening out of the market for Canadian newsprint would doubtless take care of the present overproduction of newsprint and would leave room for further expansion. It is by no means unlikely that it would result in a return to the former price of $75 a ton, which was recently reduced to $73, and in some cases to $70.

Riordon Not Merged with International

The rumored absorption of Riordon by International Paper was promptly denied by President A. R. Graustein, who stated that there was no truth to the story. Notwithstanding this denial, the belief persists here in Montreal that there is something doing in the direction indicated by the rumors, and the old saying that "the market discounts developments well in advance" appears to be indicated by the fact that there has been a remarkable recovery in the price of Riordon bonds during the past few weeks, some of them having gained as much as 18 points. Boston bondholders are said to be the chief parties in the informal negotiations which are said to have been carried on with the International Paper Company. The Graustein denial is described here as "technically correct." In view of the policy of International to expand its operations in Canada, the acquisition of the Riordon properties would be of incalculable value to the big American company.

In the meantime all the Riordon properties have been advertised for sale, to take place by auction on September 8. This is taken to mean that the first mortgage bondholders will secure possession of the properties and will be in a position to negotiate for the sale of the mills, limits and waterpower sites to anybody that is in the market. It is probable that the bondholders will put in a bid that will cover their own interests in the property and that, automatically, claims of creditors and shareholders will be wiped out.

The ultimate disposel of the properties is being watched with considerable interest, and it is expected that it will finally pass into the hands of International Paper.

Bay Sulphite Reorganization

The Bay Sulphite Co., which operated pulp mills at Chandler and Port Alfred, Que., is being reorganized under the name of the Port Alfred Pulp and Paper Co. New capitalization is being arranged through the Wood, Gundy, Sweezy interests, who, it is understood, will again be the dominating influence in the company. The bondholders of the Bay Sulphite Co. have expressed unanimous approval of the arrangements that have been made for the transfer of the property to the new company. It is understood that the terms of the financing will assure them of an exchange of their bonds for an equal amount of bonds of the new company, and the latter will bear the same coupon rate of 6.5 per cent, and have the same maturity, April 1, 1943. In addition, operations of the company will be benefited by substantial working capital provided by securities that will rank after the first mortgage bonds.

In spite of unfavorable conditions in the pulp market and the special difficulties the company has had to face during the past year, the mills at Port Alfred have been kept operating continuously, and it is understood that the production at the present time is the highest in the history of the company. This sulphite pulp, at the rate of about 40,000 tons a year, is being all exported to the United States. Moreover, the operations are being carried out more efficiently than ever before, and even at the existing low market price for pulp the company is earning not only bond interest but depreciation and sinking fund, with a margin to spare.

The reorganizing interests have not yet announced whether they will take over the Chandler mill or whether it will be given up.

COMBUSTION ENGINEERING CORPORATION LIMITED
POWER PLANT EQUIPMENT
STOKERS OF ALL TYPES · PULVERIZED FUEL SYSTEMS · STEAM TURBO-GENERATORS · HIGH SPEED STEAM ENGINES · WATER TUBE BOILERS
AIR PREHEATERS · RADIAL BRICK CHIMNEYS · COAL HANDLING EQUIPMENT · ASH CONVEYORS AND HOPPERS · STEAM PIPING
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VANCOUVER, MONTREAL, WINNIPEG

Forest Industries Association Appoints Manager

Major J. A. Duchastel de Montrouge, general manager and city engineer of the city of Outremont, Que., a suburb of Montreal, has been appointed general manager of the newly formed Quebec Forest Industries' Association, at a salary of $15,000 a year. He will reside in the city of Quebec.

Major Duchastel was born in New York, the son of Leon Duchastel de Montrouge, for many years French consul in Montreal. He was educated in Montreal, at the Mont. St. Louis and the Ecole Polytechnique, where he graduated as civil engineer. Previous to entering the service of the city of Outremont he held posts with the Canadian Pacific Railways and with the Dominion Bridge Co.

The Quebec Forest Industries Association is the outcome of a meeting of the limit holders held in Montreal in January last, when it was decided to reorganize on a new basis the former Province of Quebec Limit Holders' Association. The association is expected to be the authorized body of the larger group of limit holders to deal with the Federal and Provincial governments and also to be the intermediary with other interests in discussing matters connected with the pulp industry. It is expected also to bring about coöperation between the various groups of pulp interests, and to have an influence in stabilizing pulp prices.

Bear River Mill to Start Up

After being closed for over two years, the mill of the Bear River Pulp and Paper Co. at Bear River will resume operations. This industry was established by Clarke Bros. Co., and operated successfully for several years.

The concern went into bankruptcy two years ago, and since then the affairs of the defunct company have been involved, owing to controversies between the bondholders. The reorganization was effected by New York interests, in association with pulp and paper men from other States.

The new company is spending in the neighborhood of $300,000 in the rehabilitation of the mill. Several new machines are being installed which will not only increase production but will put the mill on a more efficient basis and reduce overhead. A pipe line for the supplying of water is already practically completed. The line is about five and one-half miles in length and runs from the east branch of the Bear River to the mill.

It is expected alterations will be completed and the mill in operation by October 1st next.

Interim Report of Saguenay Committee

The bondholders' protective committee of the Saguenay Pulp and Power Company have issued an interim report in which the work accomplished is outlined, and pointing to an early solution of the task which was set for the committee in getting the affairs of the company into better financial shape. The report is a lengthy one, rehearsing the various matters and difficulties with which the committees have had to deal. In closing, the report says:

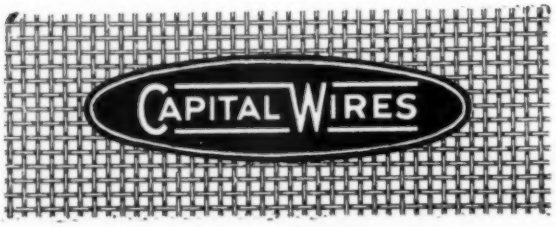
"The committee, having good reasons to suspect concerted action by possible purchasers of the assets of the Chicoutimi Pulp Company, has lately been considering various schemes of reorganization. One of these should, in the estimation of

Abe Lincoln, being a Student of Economics, usually said a mouthful when he spoke.

HIS REMARK that he did not know much about the Tariff but one thing he did know was that when you bought goods abroad, you got the goods and they got the money, but when you bought goods at home we get both the goods and the money applies to-day the same as it did in 1862 only more so—

To Promote Prosperity, Buy at Home and Buy Now

FOURDRINIER WIRES



CYLINDER COVERS

· ALL MESHES

CAPITAL WIRE CLOTH & MANUFACTURING CO., LTD.
OTTAWA, CANADA

Canadian Section

the committee, prove wholly satisfactory to the bondholders. The committee hopes soon to be able to submit it in detail. It can only state in the meantime that the main feature of this scheme is the merging of the various properties—and the consolidation of the present first mortgage bonded debts at their present figure, working capital requirements being procured through an issue of common stock and not through an additional issue of bonds. Whilst it will be seen that the task of your committee has by no means been an easy one, the committee, with the assistance it is getting from the banks, the bondholders' trustees, the trustee in bankruptcy, the officials of both the Chicoutimi and Saguenay companies, and the committee's legal counsel, Aimé Geoffrion, K. C., is confident of being able to carry out its work to a successful end."

Port Alice, B. C., Pulp Mill Resumes Operations

The Port Alice mill of the Whalen Pulp and Paper Co., on the British Columbia Coast, has been reopened after a shutdown of four months. Three hundred men are employed at the mill, which has a capacity of 80 tons a day. Definite orders have been secured from the United States, from Japan and, to a smaller extent, from Australia, which will keep the mills running continuously until the end of the year, at least, and possibly longer.

When the mill closed in March there was great uncertainty about the Japanese market, and this, combined with the smallness of the contract orders, was the cause of the plant closing. These difficulties have now been overcome, and the outlook is much brighter.

According to G. F. Gyles, deputy receiver, the status of the Whalen company remains very much as it was. It will continue to operate on the same basis as before, with the possibility of some reorganization taking place at some future date. Reports in commercial circles are to the effect that about $1,500,000 will be expended on a new power plant which will involve the building of a tunnel through the mountains to Victoria Lake, near Quatsino Sound. It is understood, however, that while this project has been considered, there is no money available for it at present. Should any large scale reorganization of the company take place, such a scheme would have to be considered as essential to the continued profitable operations of the mill.

Duke-Price Power Company Incorporated

Letters patent have been issued incorporating the Duke-Price Power Co., Ltd., with a capital of $1,500,000, definitely joining the J. B. Duke interests of New York and the Price interests in Canada. They have been working together for some time in the Chicoutimi and Lake St. John district, especially on the power development at the Grande Décharge of Lake St. John, where 800,000 horsepower are being harnessed.

The incorporators are "to develop, produce, acquire, transmit, distribute, store, use and dispose of electric current within that part of the Province of Quebec situated east of the 76th degree of longitude, for all of the purposes for which electric current or power can be or may be utilized."

It is understood that the principal source of the power referred to will be at the $25,000,000 power development in progress at the Grande Décharge. Powers are also given to the company to be recognized or incorporated in foreign countries and also to hold the meetings of directors outside this province.

The capital stock of the company is divided into 300,000 shares of no nominal value. The head office of the company is to be in Quebec.

Fire Damage in Ontario

Reports from Madawaska, Ont., indicate that the loss by fire on the Booth limits was extensive. This four-hundred-square-mile limit of white pine is one of the finest remaining in the whole province; there are many trees which run four feet through at the stump, and rear their heads one hundred and twenty feet heavenwards. Some of the finest timber, including white and red pine, hemlock and spruce and balsam, was destroyed. Much of last season's, as well as this season's, cut of pulpwood and other timber dumped and on the skids ready to be sent out has been destroyed. No doubt some of the standing timber in the area burned over, if cut at once, may be utilized.

No definite computation of the amount of timber standing in the ravaged region can be made until cruisers go over the district. J. H. MacDonald, provincial district forester for South Nipissing and North Renfrew, estimates the burnt area at between fifteen and twenty square miles of territory, approximately eight square miles of which were heavily timbered.

Another fire of rather extensive proportions took place near Hay Lake, several miles south of the Booth limit and beyond the confines of Algonquin Park.

Price of Newsprint

While it is generally understood that Donnacona Paper Company recently set a price of $70 a ton for their newsprint, it must be considered that this company differs to a certain extent from most of the other paper companies in that they are not in the open market. Their total output of 200 tons a day is taken up by one organization. The course of Donnacona has been followed, it is understood, by several other of the smaller companies, who are largely in the same position.

It is said that certain producers would not be averse to a further cut from the generally prevalent price of $73 a ton, as it would be a strong club to wield over the heads of some of the concerns in the St. Maurice Valley which at the present time are unwilling to enter the proposed giant merger of Quebec newsprint paper companies.

The newsprint situation is still causing anxiety to certain producers, especially those in the Province of Quebec, where it is believed that any further cut will result in automatic limitation of supply through the forced closing of some of the smaller mills which came into being at the peak-price time, paying heavy prices for both machinery and limits.

In other quarters it is said that the new contracts will generally be effective for three months only, and that the next revision is more than likely to be upwards rather than downwards.

Paper Machines on Order with Walmsley's

In connection with an article which recently appeared in the Montreal Star, Charles Walmsley & Co. (Canada), Ltd., corrected certain errors in the article in question: "To obviate any misunderstanding that might react to the disadvantage of the paper manufacturers, we hasten to advise you that in actual fact the total number of machines on order with both this company and our parent company in England does not approach the number mentioned in your publication. At the present time, apart from machines installed and operating, we have on order for Canada two 234-inch newsprint machines, one 156-inch newsprint machine, and for Newfoundland six wide newsprint machines and one small wrapping paper machine. Any other machines on order are for English or European account and will not in any way affect Canadian production."

The Star, however, takes exception to the last statement, and says: "Our correspondent is obviously wrong in his argument about new machines for English or European account having no effect on Canadian production. It is European production that is today unsteadying the Canadian market. If the European production is to be increased the unsteadying will clearly be intensified. It is the old story. When an industry is making fair profits promoters are tempted to increase competition and sometimes so recklessly that important industries are ruined."

Protests Against Harbor Works at Matane, P. Q.

A vote of $75,000 for harbor improvements at Matane, P. Q., met with determined opposition in the House of Commons at Ottawa when estimates of the Public Works Department were under consideration in committee of supply.

Hon. J. H. King, Minister of Public Works, explained that

Aught or Naught?

—and the engineer said:

"The old pump is done for, boss—we'll have to have a new one."

When you face the prospect of putting in a new pump, what does the record of your old pump mean to you—aught or naught? When your pump has given you years of service plus —the record of its builder is good. Our history stands for you to read.

SMART-TURNER Horizontally Split-Shell Centrifugal Pump

is a production we are proud to put our name plate on. Years and years from now you will be satisfied with your judgment in putting one of these sturdy pumps for regular hard duty in your factory or works.

S-T-M PRODUCTS:
Steel Barrels, Centrifugal Pumps [Belt or Motor Driven]
Power Pumps, Steam Pumps, Pump Accessories
Air Compressors.

SMART-TURNER MACHINE CO., Ltd.

Hamilton, Ontario

REPRESENTATIVES: Vancouver, Calgary, Edmonton, Winnipeg, Toronto, Ottawa, Montreal, St. John, Halifax.

the appropriation constituted the contribution of the Government to the construction of a wharf at Matane. The Hammermill Paper Co., which used the wharf to ship pulpwood to its mills at Erie, Pa., was contributing the sum of $100,000 toward the construction of the wharf, and the Government had already paid $25,000.

Several members of the opposition spoke very strongly against the appropriation on the ground that it was promoting the exportation of raw pulpwood from Canada, and also causing a loss of revenue to the Canadian National Railways, which had a branch line to Matane and which could carry out the pulpwood. Right Honorable Arthur Meighen, leader of the opposition, said that it was difficult to find words to describe a Government which put its hand into the treasury and bonused an American company to send raw material out of Canada.

The vote finally carried.

Thunder Bay Pulpwood Going to U. S.

Exportation of pulpwood from Thunder Bay district to the United States totaling nearly 100,000 cords is under way, and boats are loading at Port Arthur and Fort William for Detroit and Erie. Automatic loaders are now taking the place of manual labor. In the sheltered position behind the breakwater where the ships are loading not much wood is lost by drifting to shore; but in the open bay at other loading point loss from this source is considerable and is estimated at about 10 per cent.

The Port Arthur office of the Hammermill Paper Co., of Erie, Pa., will be handling about 65,000 cords of pulpwood this year, 20,000 of which have been purchased directly from settlers on cars and on the banks of the various streams, and the balance from jobbers. The drives have gone exceedingly well this season considering the weather, and the wood has all come down safely below the Kakabeka Falls. The company had shipped 25,000 cords by the 1st of July, which is much better than in previous years.

Belleville Paper Mills Bankrupt

Holders of bonds of Belleville Paper Mills, Limited, will now have anxiety as to their standing, in view of the announcement that the company has been adjudged bankrupt. This business was first started up by Stephen Lazier in 1878 and incorporated in 1907 as the Lazier Paper Mills, with an authorized capital of $50,000. It operated at intervals for a number of years, but was acquired in 1919 by T. P. Birchall and associates under circumstances which did not give much hope that it would have any greater chance of success.

Some measures taken to dispose of the common stock led to court proceedings, although the charges were finally discharged. Mr. George A. Stephenson of Toronto has been appointed custodian.

Separate Examinations for Pulpwood Scalers

According to regulations issued by the Department of Lands and Forests of Ontario scalers for Crown timber must take out separate licenses for scaling pulpwood and timber intended for other purposes. In the past no separate examination was provided for those desiring to secure qualification for pulpwood scaling, and because of that many men who wanted to take up the work of pulpwood scaling were unable to do so. They might have sufficient qualifications for scaling pulpwood, but not enough for the heavier timbers, and since there was but one examination they were barred from the work.

The department has overcome the situation in the interests of the men by announcing that separate examinaions will be held for the pulpwood scalers. The examinations will be held during August at suitable points through Northern Ontario, including Iroquois Falls, Elsas, Callander, Fort Frances, and Thessalon.

Port Alfred Reorganization Proceeding Satisfactorily

J. H. Gundy, of Wood, Gundy & Co., Toronto, spent a good deal of time in Montreal lately in connection with the reorganization and purchase of the Bay Sulphite plant by the Port Alfred Pulp and Paper Company, and then went on a tour of inspection of the company's mill.

The Port Alfred Company is capitalized at 630,000 shares of common stock of no par value, and it will have the same funded debt as the Bay Sulphite Company, namely, $4,000,000. In addition, the company is authorized to issue $3,000,000 of

Canadian Section

debentures, of which $1,500,000 will be presently issued to provide working capital.

It is hoped that the company has now entered on an era of prosperity owing to the improvement of the pulp trade. Provision has been made for the installation of newsprint machines when the proper time comes.

More Shareholders Than Employees

The Laurentide Co., of Grand'Mère, P. Q., has more shareholders than employees, which is partly due to the keen interest which the latter take in the operations and affairs of the company. The company has 581 employees, most of whom live at Grand'Mère, and who own about 25 per cent of the stock.

The 288,000 shares of Laurentide stock are owned by 2,312 shareholders, each owning an average of 125 shares.

Vanderbilt Mill in British Columbia

Cornelius Vanderbilt, Jr., who last winter established daily newspapers in Los Angeles and San Francisco, announced in an address to the Gyro Potlatch committees at Vancouver, B. C., that he and his associates were making arrangements for the construction of a pulp mill in British Columbia.

He made it plain that it was not his intention to enter the newspaper field in Vancouver or anywhere else in Canada, declaring that it was his belief that the newspaper business was not an enterprise in which an American should engage in Canada, nor a Canadian undertake in the United States.

Mr. Vanderbilt gave an interesting talk on the newspapers he had started in Los Angeles and San Francisco, and the organization of young men assisting him in making the enterprise successful. As an active member of the Los Angeles Gyro Club he was given a rousing welcome.

Reforestation by Ontario Government

A total area of 1,000 acres of land in Whitchurch Township, North York, is to be reforested, according to a decision made recently by York County Council, following consideration of the report of its committee on reforestation. Six hundred acres, the report stated, have been taken over, and 150 acres have already been planted, under the supervision and at the expense of the Ontario Government. Owing to the success of the venture the committee recommended the extension of the area over another 400 acres, and the planting of the whole area with suitable trees.

A total of 176,500 trees have been planted this year, and their growth is already very marked. The trees are: white pine, 13,000; Norway pine, 43,000; Scotch fir, 65,000; jack pine, 42,000; tamarack, 7,500, and Caroline poplar, 6,000. The cost of planting was $1,479.

More Merger Talk

Speculators must evidently find an outlet for their surplus energy when things are quiet on the market. The merger rumors have therefore been revived, and this time the rumor includes Price Bros., St. Regis Paper, Belgo, St. Maurice Paper, Spanish River, Laurentide, and other subsidiary organizations controlled by these companies.

There has been talk in the last few months of the amalgamation of a number of the pulp and paper interests, but attempts made proved abortive in every case. This is the first time that Price Bros. and St. Regis have been mentioned in any rumored merger. From the same source it is also learned that the capitalization of the interests represented would reach nearly $300,000,000, and though operating together the merging interests would retain their identities as companies.

Walmsley's Longueuil Plant Has Big Orders

Charles Walmsley & Co. (Canada), Ltd., have been awarded a contract by the E. B. Eddy Co., Ltd., of Hull, P. Q., for a 234-inch wire newsprint machine, complete with Harland sectional electric drive. This machine is of the same class as the Price Bros.' Nos. 6 and 7. No. 6 recently was noted in these columns as having made a world's record run of 106.6 tons in 24 hours, and has since beaten its record by a 110-ton run.

The new Eddy machine will be manufactured at the Walmsley Canadian plant at Longueuil, P. Q. The order will keep the plant busy for about four to five months. It is also intimated that the Walmsley Co. has inquiries before it covering a half dozen propositions involving between three and five million dollars of expenditure in each case.

Employer Not Liable for Disease Contracted by Employees

An important decision in regard to claims for compensation under the Quebec Workmen's Compensation Act has just been handed down by Sir François Lemieux in the Superior Court of Quebec. Two lumberjacks contracted typhoid while employed in the camps of the Brown Corporation at La Tuque, Quebec. They claimed half pay during the period of illness, contending that the water of the camp was responsible for the outbreak of 15 cases of typhoid.

The court held that their case was not proven, but added that the compensation could not have been collected, even if it had been proven, as disease contracted in an industry does not entitle the worker to compensation under this Act.

Threaten to Confiscate Mills

The New Brunswick Workmen's Compensation Board has threatened to seize the properties of all companies and individuals operating in pulpwood, maintaining rossing mills, pulp mills and paper mills, etc., that do not pay the amounts that they are assessed by the board.

Harold Young, a pulpwood operator of Fredericton, N. B., found his property confiscated by order of the board, and auction announced. Mr. Young had been a pulpwood operator for many years, but owing to the slump in pulpwood he has not been operating heavily. His money being tied up, he was unable to meet the demand of the compensation body.

The seizure of the Young assets by the board has thrown one hundred men out of work.

Preparing for New Kraft Mill

The Continental Wood Products, Limited, of Elsas, Ont., of which L. E. Bliss is vice-president and manager, have erected a number of new residences for their employees and are now building some cottages for a band of Indians who had located on the site on which the new Kraft mill is to be constructed soon.

The engineers are now at Elsas surveying the waterpowers, etc., for the 100-ton Kraft mill which the company will put up. The company has also representatives in Sweden making a close survey of the Kraft mills there, so that they will get the best possible ideas in the erection of the new mill.

R. S. Kellogg at Fort William

R. S. Kellogg, secretary of the Newsprint Service Bureau of New York, recently addressed a largely attended meeting of the Canadian Club at Fort William, Ont., on "A Paper Age." Subsequently Mr. Kellogg and Mr. A. P. Costigane were the guests of the Rotary Club at an entertainment in the new civic park at Fort William.

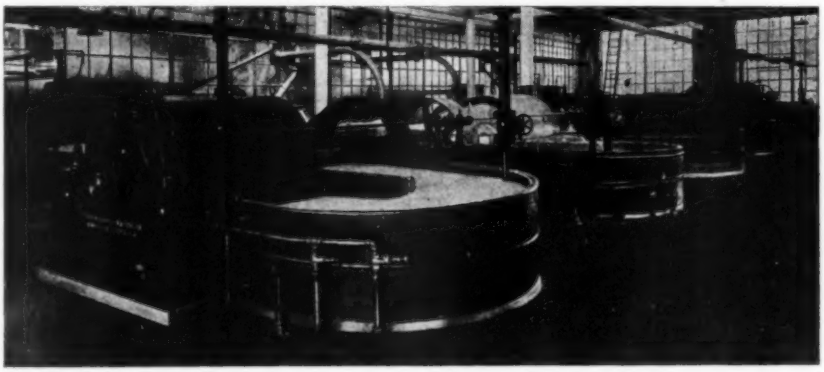
That Mr. Kellogg was induced to go to the head of the Lakes to give such a stirring and timely address is a testimony to the growing importance of that section of Ontario in the paper production of the continent and to the business interests that have the industrial future of Fort William and Port Arthur at heart.

Construction of A. P. W. Mill Proceeding Rapidly

Early work on the construction of the Albany Perforated Wrapping Paper Company's mill at Sheet Harbor, N. S., was somewhat handicapped by the unseasonable weather; but it is now proceeding satisfactorily, and work is well under way on the main building.

The equipment to be installed is to be modern in every particular. There will be fire-fighting apparatus, and one of the first steps of the company will be to organize a fire department among the employees.

The Parsons-Ed Construction Company, who are executing the contract, expect to have it completed late in the winter. They also have the contract for the installation of the pulp manufacturing equipment.



AN INVESTMENT in our beater room equipment means better beaters and Jordans. Our machinery embraces the most approved and advanced designs, together with heavier construction and the most careful workmanship.

The Noble & Wood Machine Co., Hoosick Falls, N.Y.

Canadian Builders: Port Arthur Shipbuilding Co., Ltd.
PORT ARTHUR, ONTARIO

Company Patrolling Its Own Limits

The Shevlin-Clarke Co., Ltd., Fort Frances, Ont., of which B. W. Lakin is general manager, have installed their own fire-fighting equipment to protect a considerable portion of their limits. This is an installation that is, to say the least, unique in New Ontario, and is being tried out with considerable interest.

The company have put out their own fire patrols this year. They have two patrols working, one north of Flanders, in the Clearwater District, and one working south of Flanders, covering the Quetico forest reserve along its north side and east to Pickerel Lake.

These crews are provided with gasoline-driven canoes and gasoline portable fire pumps, with 500 feet of hose. The canoes are sturdy enough to withstand a certain amount of hardship, but not too heavy to portage.

St. Regis Issues Bonds

E. H. Rollins & Sons and F. L. Carlisle & Co., Inc., offer a new issue of $1,500,000 St. Regis Paper Company of Canada, Ltd., 6.5 per cent serial gold debentures (closed issue) and unconditionally guarantee principal and interest by St. Regis Paper Co.

Proceeds from the sale of this issue will be used to reimburse the treasury of the parent company for capital expenditures already made, to acquire a site for the erection of a Canadian groundwood and paper mill, and to purchase additional timber lands.

Forest Fires in Quebec

From the time the snow left the ground until the end of June one hundred and seven outbreaks of fire were reported to the Quebec Protective Service. In the greater number of cases most of these fires were speedily extinguished, and the damage was insignificant. About a dozen lasted over twenty-four hours, but the area affected by the flames did not exceed five square miles.

A serious fire which broke out in the early part of July in the Gaspé peninsula defied the efforts of several hundred fire rangers with modern fire-fighting equipment for several days. It was finally extinguished by a timely downpour after it had caused considerable damage to timber of great value.

Dominion Engineering Reorganizes

Shareholders of Dominion Engineering Works, Limited, are now receiving stock in the newly formed company that has been organized to take over the old company of that name. Holders are receiving one common share in the new company for each two shares of preferred stock formerly held, while common stock holders have been wiped out entirely. It is planned to offer $400,000 of common stock to shareholders, and it is likely that a good proportion of this will be taken up by Dominion Bridge, who in all probability will continue to hold controlling interest in the company.

A considerable amount of stock is held by some of the larger power and paper companies of Canada.

New Waxed Paper Company

James McArthur and George Courtenay have formed a new company under the name of The Canada Waxed Papers, to manufacture and deal in all kinds of waxed, parchment and other papers. Mr. McArthur was, until a few months ago, managing director of the British-American Waxed Paper Co., Toronto. He first joined that company in 1909 and worked through every department of the factory. The company was at that time controlled by the Waterproof Paper and Board Co., Cincinnati. Mr. Courtenay comes from Belfast, Ireland, where he got his first initiation into the paper business, spending some 15 years in the employ of W. and G. Biard, Limited. The new company will operate in Toronto.

Thunder Bay Extension Progressing Rapidly

F. N. Youngman, manager of the Thunder Bay Paper Co., Port Arthur, Ont., states that he expects the new addition to the mill to be completed by September 1.

The extension, which is 96 feet by 130 feet, will nearly double the capacity of the mill, increasing it to about 120 tons a day.

The members of the Board of Trade of Quebec, who made a tour of Northern Ontario recently, paid a visit to Iroquois Falls, where they were conducted through the large mill of the Abitibi Power and Paper Company.

McArthur Tries to Get New Limits

An effort is being made by J. D. McArthur, who is proposing to build a paper mill at St. Boniface, Man., to obtain certain changes in pulpwood limits that he holds from the Ottawa government. He is anxious to have some of his present limits exchanged for new limits on exchange basis, but the Department insists upon advertising the new limits for sale in the ordinary way and letting Mr. McArthur take his chances along with the rest.

He was accompanied on his visit to Ottawa by George Seaman, the Chicago capitalist who is backing the scheme.

Grand Old Man of the Industry

One of the most prominent, and certainly the most picturesque, figure in the Canadian pulp and paper industry is undoubtedly John R. Booth, owner of the Booth mills at Ottawa and of extensive timber limits in the watershed of the Ottawa River.

Despite the fact that he is now in his ninety-eighth year, Mr. Booth's activity might put to shame many a man of half his years. He attends to his work regularly every day, and he recently went to Algonquin Park to direct the efforts of a force of over two hundred men who were fighting strenuously to control a severe forest fire on the Booth limits in that district.

Changes in Canadian Exhibit

Changes are made from time to time in the pulp and paper display at the British Empire Exhibition. Recently an important change was made in showcase 87b. A very fine wax figure of a young woman, the latest from Paris, was placed in the window. "Miss Kipawa," dressed in a beautiful peach-colored brocade made by Courtaulds, Limited, from the well-known Kipawa pulp of the Riordon Pulp Corporation, is one of the most attractive features of the Canadian pavilion.

A placard briefly describes the manufacture of viscose artificial silk, for the benefit of the numerous interested visitors who stop to admire the display.

New Tug for Bathurst Company

The big steel ocean-going tug, "Ste. Anne," purchased by the Bathurst company from parties in England, arrived at Bathurst recently after a fourteen-day voyage from Southampton. The vessel is well-fitted.

The new tug was purchased by the company to take the place of the Betty D., which for some years has performed yeoman service. The Ste. Anne was built in 1919 for the British Admiralty and after one year's service was laid up, so that she is practically a new boat. She is now being put in condition after her trying ocean voyage, and will likely be accepted by the Bathurst company in the course of a few days and start work towing logs across the bay.

N. B.'s June Forest Fire Record

Twenty-three hundred and thirty acres of timberland in New Brunswick were burned by forest fires in the month of June, according to reports made in the Department of Lands and Mines. The damage is placed at $5,500 to private property, $100 to Crown land property, $105,000 to privately owned timber and $100 to Crown timber. The largest fire of the month was that which covered 1,200 acres of privately owned land at Little River, near Bathurst.

Twenty of the fifty-four fires in June were the result of burning piles of slash contrary to law, and a number of prosecutions are being carried on as a result.

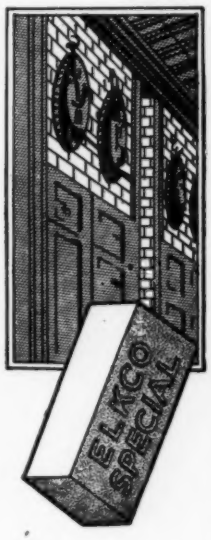
Investigating Forestry Situation in Quebec

Eight squads of forest engineers, under the direction of Victor Baillarge, one of the assistants to the Chief Forestry Engineer of the Province of Quebec, left Quebec on the 11th of last month for the counties located near the American borders, where they are to make a special study of the forestry situation.

In addition to ascertaining whether the province is on the eve of an invasion by the gypsy moth, the engineers will also report on the general condition of the timber in those regions. It is not expected that a report will be available before late next fall.

The Don Valley Paper Mills, Ltd., of Toronto, have moved their downtown offices from the Dominion Bank Building to more commodious quarters in the Federal Building.

Fire Brick and Fire Clay



The making of pulp and paper is not accomplished under conditions common to all. They vary greatly. The fire brick that would suit one condition or equipment might fail in another. There is as great a difference in fire brick clays and processing as there is in the selection and processing of raw material in the paper industry.

Tell us your Conditions or Equipment and we'll supply the proper Brick.

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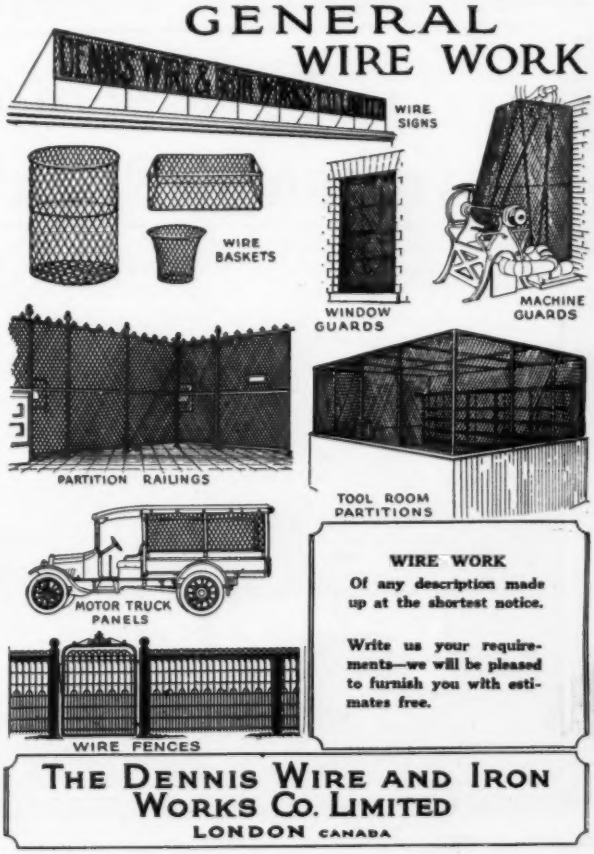

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Of any description made up at the shortest notice.

Write us your requirements—we will be pleased to furnish you with estimates free.

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Knowing how—from Experience

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WORM GEAR
REDUCTION UNITS

The Cleveland Organization today is the organization which brought Cleveland Worm Gear Reduction Units to their present state of efficiency. The result of twelve years of pioneering experience is reflected in the superiority of our product.

In the last 5 years alone over 3,000 Cleveland Worm Gear Speed Reducers have been sold in the industrial field, going into practically every basic industry in this country. This, in addition to the countless thousands that are serving the automotive industry today, represents a wealth of practical data and knowledge that cannot be obtained otherwise. This information is yours for the asking.

There is a Cleveland representative near you who will be pleased to assist you in your speed reduction problems.

THE CLEVELAND WORM & GEAR CO.
America's Pioneers in Worm Gearing
Payne Avenue & 40th **CLEVELAND, OHIO**

Real Merit Placed

Lindsay Fourdrinier Wires

In Many Mills

HONEST SERVICE KEEPS THEM THERE

They are ready to serve you

The Lindsay Wire Weaving Company
Collinwood Sta., Cleveland, Ohio
"Ask any Papermaker"

Judgment on Pulpwood Action Handed Down

Justice Wright recently delivered judgment at Toronto, awarding the sum of $830 and costs to M. E. Woodcock, storekeeper of Klock, Nipissing district, who sued G. B. Ferguson and J. H. Findlay, lumbermen, of Renfrew, Ont., to recover $15,000, being the sum alleged to be due under an agreement for the purchase of 5,000 cords of pulpwood at $9 a cord.

It was argued that, after 1,900 cords had been cut and delivered, the defendants refused to take any further deliveries. The court found that the claim for damages was very much overestimated.

The Department of Colonization of Ontario is doing some colonization on the limits in the Thunder Bay District of the Provincial Paper Mills, Limited. Quite a number of Danes have already been put in there and are using the company's roads and improvements while they are cutting pulpwood for the organization.

Pulp and Paper Exhibit Attracting Attention

According to advices from London, the Canadian pulp and paper exhibit is being visited by many people and a considerable number of trade inquiries are being received. Edward Beck, secretary of the Canadian Pulp and Paper Association, Montreal, is active in organizing means to bring Canadian productions before British buyers.

F. G. Robinson, of the Riordon Corporation of Montreal, is in London in connection with the exhibition and with trade affairs relating to the company he represents.

Operations in the Maritime Provinces

The Fraser Companies' pulp mill at Chatham, N. B., has reopened after a layoff of six weeks; the Nashwaak Pulp and Paper Co.'s mill at St. John, N. B., has reopened after a layoff of two weeks; while the Bathurst Co.'s pulp mill remains closed and may not be reopened until early in the fall.

The McLeod Pulp and Paper Co., operating two mills on the Mersey River, are operating on full time, although reports are current that at least one of the mills will announce a curtailment in production. One of the mills is at Cowie Falls and the other at Rapid Falls.

Another Mill in the Abitibi Region

Interests which are not fully described but are said to include the Brompton people and the Lotbinière Lumber Co., are to erect a pulp mill in the Megiscane River district in the Abitibi.

A few months ago a series of waterfalls in that section were leased by auction from the Department of Lands and Forests, and timber limits were also taken over.

The management of the Brompton company have denied that they are in any way involved in the matter.

Improvements at Mille Roches

The Provincial Paper Mills, Limited, of Toronto, are carrying out a number of improvements and additions at their mill at Mille Roches, Ont.

These include the construction of a new three-story warehouse, 120 by 80 feet, built of gray granite, the raising of the roof of the beater room and putting on a steel and gypsum room. Installation of new beaters and Jordans has been completed. The program of construction and renovation will entail an outlay of approximately $100,000.

New Officers of Canadian Paper Box Mfrs. Assn.

At the ninth annual convention recently held in Ottawa, the Canadian Paper Box Manufacturers' Association elected the following officers for the coming year: President, George Hancock, of the Galt Paper Box Co., Galt, Ont.; vice-president, J. L. Constantineau, King Paper Box Co., Montreal; secretary-treasurer, S. J. Frame (re-elected), Toronto; directors, B. Sproule, R. S. Dunlop, and J. B. Lawrason, of Toronto, and L. J. A. Amyot, Quebec.

Newfoundland Represented at Wembley

Newfoundland has an interesting exhibit at the British Empire Exhibition, and one of its important features is the exhibit of the Anglo-Newfoundland Development Co. exhibiting models of its pulp and paper mills built by its pattern makers.

The pulp and paper industry of Newfoundland has grown rapidly and it is expected that Newfoundland mills will ultimately produce one thousand tons of newsprint daily.

Reduce the Hidden Costs of Mill Operation

The stitching and slipping of poor quality belts costs the paper industry countless dollars every year in wasted time. This loss in your mill can be greatly reduced by using a belt specially designed and built for the type of work it is to be called upon to do.

The Republic Invader and Double Cross are belts of this character. Constructed of the highest quality duck and damp proof friction, paper mill operators the country over have found them the most efficient and satisfactory belts on the market for paper mill work.

Our engineers are always at your service for consultation on your individual belting problems.

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BELTING ✓ PACKING
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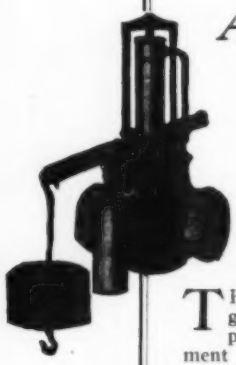

A common waste that can be cut out

According to the late Charles P. Steinmetz, the best that modern methods can do is to extract 20% of the heat from fuel. It certainly pays us, then, to spend that much carefully.

THE auxiliary or process that is getting your boiler's full steam pressure when its actual requirement is far less than that amount is one of the reasons for the big coal bill. The Davis Pressure Regulator furnishes the means for reducing those pressures, and the annual saving that comes from cutting those pressures a third or a half is astonishing.

Its utter simplicity and good design and workmanship make it most dependable. It operates noiselessly. Its action is visible, and it can be tested by hand.

Where shall we send your free copy of the Davis Catalog fully describing this and the rest of the Davis line? Address the G. M. Davis Regulator Co. at 414 Milwaukee Ave., Chicago.

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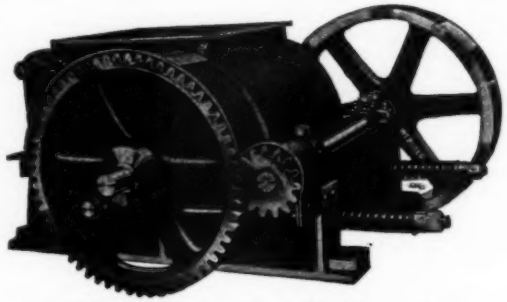
SPECIALTIES

PI-8F-RTG



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will insure a regular supply of properly sized coal for your automatic stokers at a low cost per ton.

They are built in single and double roll types, in capacities to handle 30 to 200 tons per hour.

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PURIFICATION SYSTEMS
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FOR BOILER FEED AND
ALL INDUSTRIAL USES

WM. B. SCAIFE & SONS CO., PITTSBURGH, PA.

Work Begun on Viscose Factory

Work has been started at Cornwall, Ont., on the construction of the million and a half dollar factory of Courtauld's, Limited, of London, England.

When completed the plant will give employment to five hundred hands. Viscose silk manufactured from the high-grade bleached sulphite produced at the Kipawa mill of the Riordon Pulp Corporation will be the main product.

Backus to Start Dam

Reconstruction of Norman Dam on the Lake of the Woods, an enterprise involving the expenditure of several million dollars, will be started within the next few weeks, E. W. Backus, president of the Backus-Brooks Lumber Company, of Minneapolis, announced on July 30th.

With the completion of the pulp and paper mill it is expected that the daily output of paper will exceed 135 tons.

New Factory Running

Gummed Papers, Limited, Brampton, Ont., which recently completed a new factory, is now operating this plant in addition to the old one.

The company has been making rapid progress of late and manufactures flat gummed papers of all kinds, cloth-lined papers, waterproof papers, sealing machines, stay-papers, etc.

Dry Weather in the West Disastrous

During the dry weather which prevailed in the West during the second week of July several forest fires broke out in British Columbia and Alberta, and could not be controlled despite the desperate efforts of hundreds of men in the various localities affected.

Heavy rains finally got the better of the fire, but only after a tremendous amount of damage had been done.

Some of those who imagined that the cultailment of production by the International Paper Co. in the United States would result in a stronger demand for Canadian newsprint mills generally are disappointed, for the management of International Paper has definitely stated its intention to increase its Canadian output, either by installing new machines at the Three-Rivers mill or by erecting a new mill at Baticsan, P. Q.

Exports of Canadian pulp wood to the United States again show an increase for the twelve-month period ended June 30, 1924. During that year they totaled 1,332,106 cords, valued at $13,608,361, as against 1,281,298 cords, valued at $12,248,316, during the previous year.

Spanish River Conserves Limits

An important step has been taken by the Spanish River Pulp and Paper Mills, Limited, in actively entering upon a carefully studied and thoroughly organized policy of forest conservation and reforestation. Such a policy has been pursued for some years by the Laurentide Company, Limited. The movement in this direction is growing and will undoubtedly be found reassuring to the thousands of investors in pulp and paper securities in this country, enhancing as it does the permanency of their investments in Canada's most productive industry.

The Spanish River Company has organized a Forestry Branch of the Woods Department, the work of which will include the making of surveys for immediate and future operations, utilizing the airplane to a large extent in such surveys. Advance surveys are being carried out at the rate of about 2,000 square miles per year. Cut-over areas will also be kept in touch with to show how reproduction is progressing, and thus enable the company to keep up to date its inventory of available raw materials.

Research is being carried out into possible changes in methods of cutting and degree of utilization of stands of timber which may be necessary to achieve a sustained yield of wood from the various stands of the company's limits.

There are also large areas which have been burned over and rendered barren which are capable of growing pulpwood, and the company has established a nursery at Carp Creek, capable of developing half a million plants annually. Plants from the nursery will be used in the reforestation of barren areas and planting in such places will be started next year.

One Man Takes the Place of a Whole Gang and Does More Work

ONE man will unload and store from three to ten cars of coal in a day with the Godfrey Conveyor, depending upon the size and type of installation—and he'll do it at a cost of from three to seven cents a ton.

You'll never have to pay another cent for demurrage and you'll never have to rustle up a gang to unload your coal. The small cost of a Godfrey and the tremendous amount it saves will surprise you.

Ask for Bulletin A-1

GODFREY CONVEYOR COMPANY

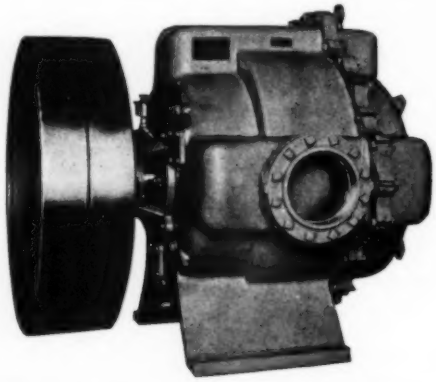
Elkhart, Indiana

THE HYTOR VACUUM PUMP FOR FLAT BOX SERVICE

Vacuum Produced Absolutely Without Pulsation

No vibration

Saves Wires



Only One Moving Part

No Rods, Pistons Crank Shafts, Loose Moving Parts and No Gears

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Dandy Rolls *Cylinder Molds*
Brass, Copper and Iron Cloth
Bank and Office Railings

WIRE SIGNS

Cheney Bigelow Wire Works
Established 1842 SPRINGFIELD, MASS

While planting at this rate would not naturally greatly affect the permanency of the company's operations, it will turn barrens into productive timberland and serve as an adjunct to natural reproduction.

The company is coöperating to the fullest extent with the provincial organization for the prevention and combating of fires.

A. R. Graustein on Inspection Tour

A. R. Graustein, president of International Paper, together with a number of other prominent newsprint men, including Major P. B. Wilson, of Sault Ste. Marie, Ont., vice-president of Spanish River Pulp and Paper Mills, Limited, were the guests of George H. Chahoon, Jr., president of the Laurentide Company, Limited, at a luncheon which he tendered on the 29th of July in Montreal.

Mr. Graustein is starting out on an inspection tour of his company's Canadian properties. One of the matters which he will attend to is the dispute between International and the New Brunswick Government following the revocation of the water power rights at Grand Falls by the New Brunswick Government on the ground of inaction. The company had planned hydro-electric development, and the construction of a paper mill. It now has a claim against the provincial government, which claim was the subject of correspondence between former President P. T. Dodge and Premier Veniot.

It is the general feeling in pulp and paper circles that International has not given up the paper mill project at Grand Falls. If cheap power is available following the development of the hydro-electric possibilities by the government, it is expected that International will build a mill for the manufacture of bleached and unbleached pulps as well as paper.

Soundness of Straw Pulp Manufacture Doubtful

Winnipeg interests are associating themselves with a new straw pulp and paper project to be known as the Canadian Chemical Pulp and Paper Co. The capitalization is $1,500,000 of 7 per cent preferred, with a like amount of common. Samples of paper and pulp made from Manitoba straw are being shown. They are admitted to be of excellent quality and were made at the Godin mills, Huy, Belgium, from a shipment of eight tons of Manitoba straw which were shipped for the experiment. The results of the tests are said to have been even better than was anticipated.

The new venture, however, is meeting with some criticism in technical circles, who have sounded a warning note to investors. Technicians say that the project is highly experimental, not necessarily in the manufacturing stages, for it has been conclusively demonstrated that paper can be made from straw, but in the marketing end. It is declared that the market for high grade papers in Canada is necessarily limited, by reason of the fact that the United States, open to newsprint, is not open to better grades of paper. This will mean that the new mill will have to find its outlet by taking business away from mills that already have a capacity beyond the needs of the domestic markets.

The great need of the country is for something to take the place of groundwood in newsprint, and this means very low price of transportation to the mill and very low conversion cost. In addition, it has not been demonstrated so far that straw pulp can be run on 200-inch machine at a speed of 800 to 1,000 feet a minute.

Laurentide's Fine Safety Record

The following figures reflect the greatest credit on the safety organization of the Laurentide company, and especially on J. H. Turner, safety inspector. The accident rate is a credit to any organization. It is hoped that the coöperation which has made it possible will be continued in years to come.

During the first six months of 1924 there were twenty-three mill lost-time accident cases. The days lost were 323 and the wages lost $1,421.65; and these figures include 156 days and $711.04 for accidents which had occurred prior to January 1st, so that the 23 accidents represent 167 days lost and $710.61 wages lost. There have been no fatal, nor any permanent nor partially permanent disabilities sustained during the period, and but one accident caused by an infection through lack of primary attention to a minor injury, involving 18 days lost and $89.10 lost wages. During May there were but two lost-time accidents, one of which occurred on the last day of the month and will thus increase the lost-time record for June. The lost time in May was 18 hours, and the wages lost $4.05. There were no incapacitated injured brought forward from previous months.

READING

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½ ton to 20 tons

ONE man with a Reading Multiple Gear Chain Block can do the work of **two** men with a screw geared block or **three** men with a differential block.

The Reading Multiple Gear Chain Block hoists freely and rapidly holds the load stationary—safely—at any point. Brake is self-adjusting, taking up its own wear. The working parts run in a dust-proof casing and operate in a bath of oil.

One man will do more work with a Reading Multiple Gear Chain Block—earn more profits. Write for **new**, free illustrated catalogue.

READING CHAIN & BLOCK CORP.
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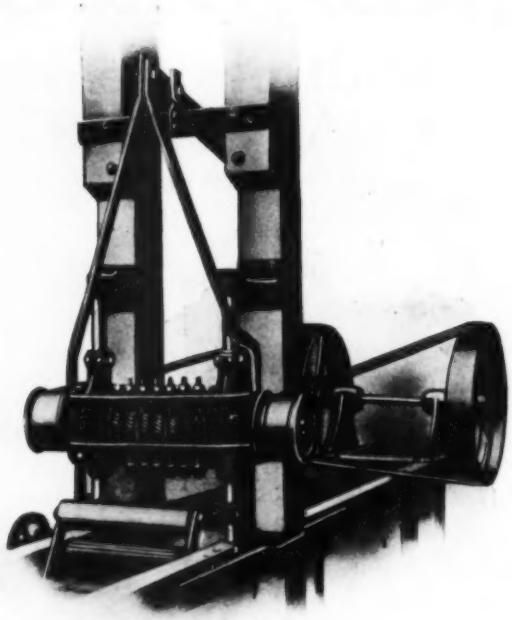
EVEREDY
Electric Hoists

¼ ton to 6 tons capacity

Twelve Spindle Boring Machine

FOR BLOWPIT BOTTOMS

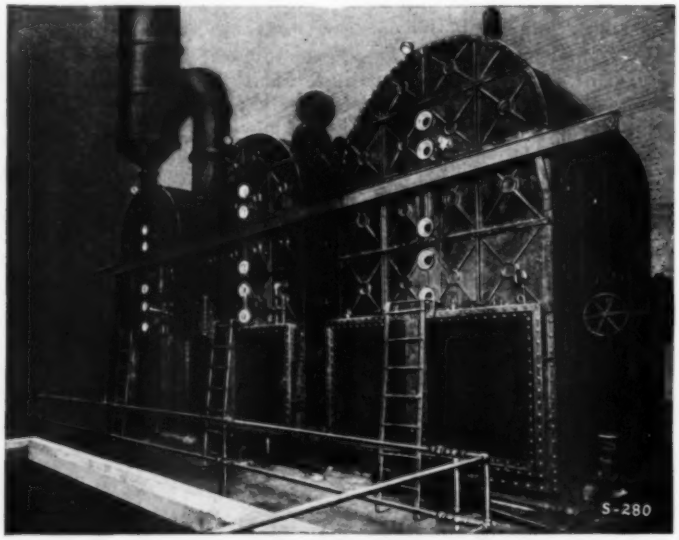


THIS machine was especially designed for boring planks for bottoms of blow pits. It bores straight or taper holes up to $\frac{7}{16}$" diameter, 1" apart each way. Will bore plank 11" wide, 18' long, with holes 1" apart, in 20 minutes. We furnish machine with guides ready to attach to wood work.

E. M. Cross Machine Co.

Berlin N. H.

The Bogalusa Paper Company Profits by a Swenson Installation—Why Not You?



If you use the soda or sulphate process, Swenson reclaiming machinery will meet every requirement. Our more than 30 years' experience enables us to render you a real service in solving special problems. Our experiment station at Ann Arbor is equipped to make tests on a commercial scale (under the direction of Professor W. L. Badger) on problems involving evaporation, crystallization, heat transfer, etc., at a moderate charge. Whiting Corporation's complete manufacturing facilities are back of Swenson products.

Submit your evaporator problems to Swenson. Bulletin P-123 on request.

SWENSON EVAPORATOR CO.

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It is of interest to note the published record for the month of May of another newsprint mill, having an output about 25 per cent greater than that of Laurentide. There were lost 1,460 hours, and $763.43 in wages; 240 hours were lost on account of wounds becoming infected. A large number of the accidents were strains and fractures of toes or fingers.

It is quite evident that the educational campaign which has been conducted in the Laurentide organization for the last few years is bringing in results—results not only to the good of the business but also to the good of the workers in freedom from disability, pain and disfigurement. One very creditable month may mean quite a lot of good luck—a continuity of good months shows good sense, judgment, and coöperation.

Canadian Paper Makers Play Safe

On his return from a visit of inspection to the Spanish River mill at Sault Ste. Marie, Provincial Paper mill at Port Arthur, Thunder Bay Paper mill at Port Arthur, Fort William Paper mill at Fort William, Detroit Sulphite Pulp Co.'s mill at Fort William, Great Lakes Paper Co.'s mill at Fort William, Keewatin Lumber Co. mill at Kenora, and Fort Frances Pulp and Paper mill at Fort Frances, A. P. Costigane, secretary-engineer of the Ontario Pulp and Paper Makers' Safety Association, expressed satisfaction at the attention being paid to accident prevention. This he found particularly noticeable in the mills of the Spanish River company where the accident record has been greatly reduced since the inauguration of a permanent safety system.

Last year these mills secured third place in the accident prevention competition for the shield and flag and it is the intention this year to leave no stone unturned to head the list. The Provincial Paper Mills, the Thunder Bay Paper Co., the Keewatin Lumber Co., the Fort Frances Pulp and Paper Co., and the other mills in the district are striving earnestly to keep down accidents to a minimum.

Water Power in Paper Making

The Dominion Water Power and Reclamation Service of the Department of the Interior of Canada has recently prepared an analysis of the use of water power in the pulp and paper industry in Canada. The importance of this industry to the national life of Canada is well known.

The capital invested in it amounts to over $380,000,000 and the exports of pulp and paper products during 1922 were valued at $123,000,000, being exceeded in value only by the group of agricultural products.

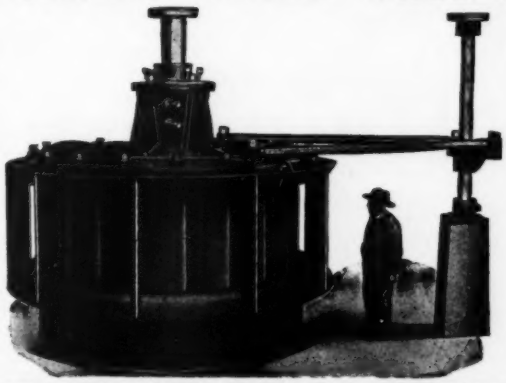
As cheap power is an essential factor in this industry, it is not surprising that 90 per cent of the power used for that purpose in Canada is derived from waterfalls. The bulletin above referred to gives a general discussion of the present use of power in the pulp and paper industry, construction activities and future power requirements, with tables showing the mills now being operated by water power arranged by provinces, with details of their power installation and other tabular information.

That Canadian salt cake will be used exclusively in this country within a very short time is the prediction of E. N. Todd, freight traffic manager, Canadian Pacific Railway. The chief demand for salt cake is by the sulphate pulp mills in Quebec and Ontario, which consume about 45,000 tons annually. At present the requirements of these mills are met by importations from the United States and England. There are very large deposits of sodium sulphate in Westren Canada, some of them being of exceptional purity, and their utilization in competition with the English and American products is entirely a matter of transportation charges.

Operations of the Oxford Paper Co., in Bay Ste. Anne District, Cape Breton, are in full swing there this season, and continued activity is assured for at least another year. More than 600 men are employed and the season's cut, it is stated, will be 30,000 cords or more of pulpwood, which will be sent to the Mumford mills by water from Murray.

The annual picnic of the Canadian Nashua Paper Co., Peterboro, Ont., was held at Wallace's Point on July 5th and proved a decided success. About 150 employees and their friends took advantage of the outing. They were conveyed to the picnic grounds, where an interesting program of games and races was conducted.

LEFFEL
TURBINE WATER WHEELS



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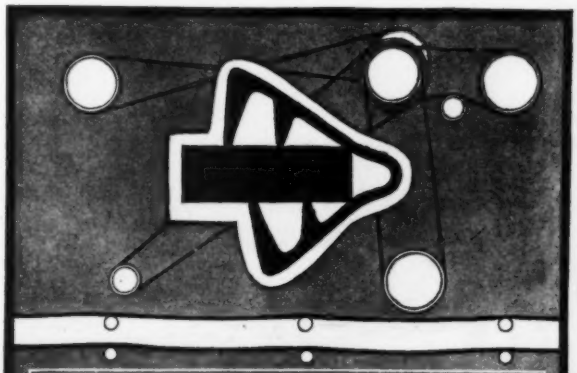

APPLIED with a hammer as the *only* tool—"A joint in a jiffy", and a joint that is smooth, flexible and separable, that gives efficient service on light or heavy duty transmission or conveyor drives, cross drives and drives with idlers. Teeth are clinched down flat and protect belt ends in a grip of steel.

Standardize your plant on Alligator Steel Belt Lacing. Sold by dealers the world over.

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Put Your Condensation to Work

CONDENSATION will form in your steam heated equipment but you can drain it as it forms, positively, automatically, and return it to your boilers as high temperature feed water.

This is what the Morehead Back-to-Boiler System will do for you. It will drain your paper machines, dryers, evaporators, or mill heating system of every drop of condensation, keeping your heating surfaces dry and hot, enabling every ounce of steam to deliver its maximum content of heat.

Furthermore, it will effect a definite saving in your fuel bill. If condensation is retarding your steam circulation, cooling your heating surfaces and stealing fuel, write us.

Morehead Manufacturing Co.

Dept. O, Grand River Avenue at Warren
DETROIT MICHIGAN

(130)

Northern New York News

August 1, 1924.

Paper Industry in Jefferson County

Secretary Clarence C. Smith of the Watertown Chamber of Commerce has completed some interesting statistics which show the importance of the paper manufacturing industry in Jefferson county. During 1923, the 15 paper mills in the county manufactured 121,232 tons of paper, including newsprint, wrapping, chip board, tag board, pulp board, Kraft, grease proof, toilet, tissue, cover paper and paper towels. This output was approximately 75 per cent of the full capacity with the present equipment.

Of the 48,974 installed horse power, only 6,215 was steam, used chiefly as a reserve for periods of low water. The balance was either water power used directly on turbines or hydro-electric power. The consumption of coal used in the drying process amounted to 126,912 tons.

Figures sent by the United States Forest Service for seven of the 15 mills show that 11,763 cords of pulp wood cut on New York state lands were consumed, and 27,679 cords were imported from Canada.

The average number of wage earners in the paper industry in Jefferson county in 1923 was 1,935. On July 15, the number was 1,930; on August 15, 1,840; September 15, 1,828; October 15, 1,882. On November 15 the number had increased to 1,960. The decline of activity in midsummer was due to the low water in Black river, but the completed section of the Stillwater reservoir is expected to remedy this.

The following are the statistics for the paper industry in Jefferson county in 1923:

Number of establishments, 15; salaried employees, 142; wage earners, 1,935; salaries, $57,440; wages, $2,304,282; cost of materials, $8,845,823; value added to material by manufacture, $4,008,134; value of products, $12,853,957; horse power, 48,974, of which 6,215 was steam; 31,500, water; electric, 11,259; coal consumed, 126,912 tons; paper produced, not including pulp, 121,232.

Two Million Dollar Action Started

Papers have been served by the present owners of the Newton Falls Paper Company against the former owners, demanding $2,500,000. Misrepresentation of certain of the properties involved in the sale of the plant of the Newton Falls Paper Company is the alleged basis of the action. The complaint is served on Frank L. Moore, president of the old company; Secretary Virgil K. Kellogg, Vice-President Stuart D. Lansing and Assistant Secretary Loren Bushnell.

The Newton Falls Paper Company was reorganized by Mr. Moore in 1907, high grade colored specialties being manufactured. In 1920 the McGraw-Hill Corporation and the United States Publishers, Inc., purchased the mill and changed it over into a high-grade book paper mill to be used in the printing of several magazines which the companies publish. Each company took a half interest in the Newton Falls company, which produces about 50 tons of book paper a day. The sale included the mill, the village of Newton Falls, including the hotel, general store, a number of dwelling houses, a timber tract near Cranberry Lake, another tract near Aldrich, and the water power at Newton Falls.

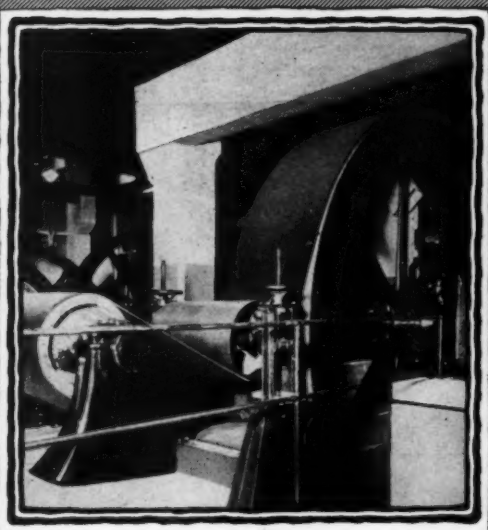
It is alleged by the plaintiffs that there was misrepresentation as to the amount of pulp wood standing on the timber tracts turned over to the purchasers; that the water power was not as represented, and that the property was not worth the $2,500,000 paid for it in 1920. They further claim that they have been obliged to expend $1,700,000 in improving and rebuilding the property. During the time that the alterations were made, Mr. Moore remained in charge. Additional water power was developed and a new machine room was constructed. After the work was completed, Leonard D. Baldwin, president of the company, assumed charge.

Capitalization of the new company was placed at $1,500,000, and the directors consist of Leonard D. Baldwin, Edward T. Magoffin, Peter F. McAllaster, Donald R. Baldwin, Howard A. Flockiger and Frank M. Van Wagonen.

It will be contended by the defendants that the property is as was represented and that the lack of success on the part of the present owners is due to their lack of knowledge of the paper manufacturing business. It is expected that the case will be tried in the spring.

The action closely resembles the action brought by William Randolph Hearst against the Dexter Sulphite Pulp & Paper Company.

Announcement is made that the St. Regis Paper Company will appeal the verdict of $500 recovered by Antonio Vittorio



The short-center drive in paper mills

SPACE-SAVING, positive, short-center drives are becoming daily more popular with paper mill engineers.

Proper belts are of vital importance on such drives. They must have the right thickness and flexibility to hug the pulleys and deliver the most power with the least tension. And rugged strength to stand the load.

You'll find the right belt for short-center drives—and for every drive in the mill—in the Standardized Series. This is a grouping of brands of Graton & Knight Leather Belts, each *standardized* to do its particular work best.

All Graton & Knight Standardized Series Belts are made of honest leather. Those for your use are proofed against water, to stand paper mill conditions. Guaranteed not to separate at the laps and plies. Give longer, more economical belting service.

Our book 101-S tells how water-proof Standardized Leather Belts improve paper mill power transmission. Write for a copy to-day.

THE GRATON & KNIGHT MFG. CO.
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Standardized
LEATHER BELTING

Nothing takes the place of Leather

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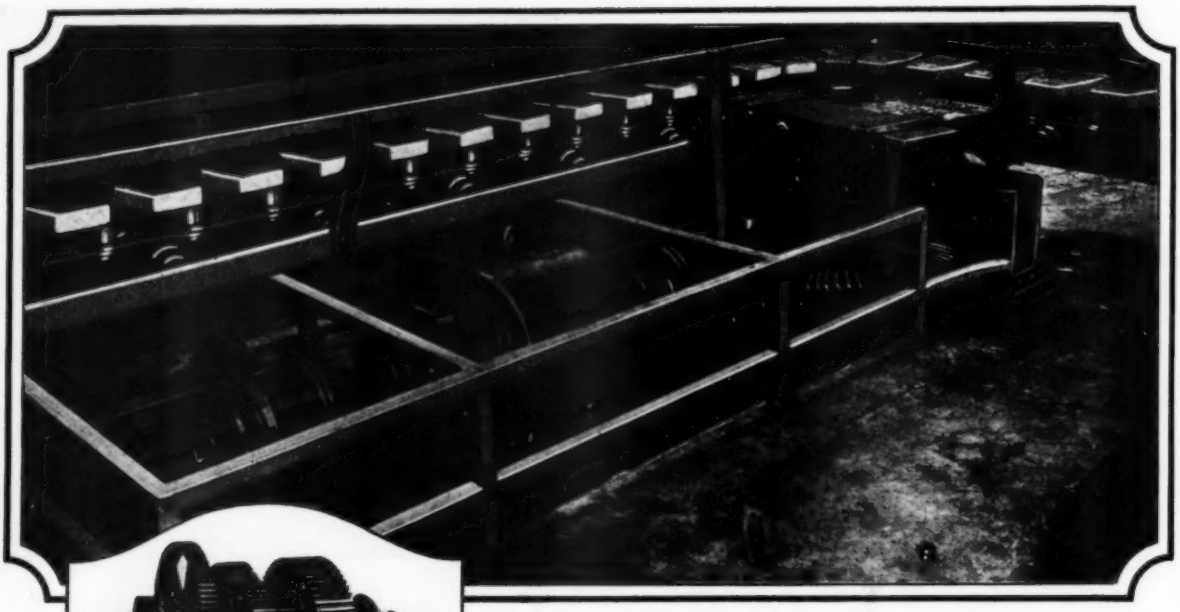

Pat. 6-10-24. Other Patents Pending.

ACCESSIBILITY: the entire mechanism is in the lower half of the housing. By simply removing four bolts the cover can be lifted off and the entire unit is open to inspection.

You'll eliminate shut-downs

PALMER-BEE Speed Reducers keep your machinery in continuous operation, thereby saving labor and materials and increasing production profits. They eliminate breakdowns and production delays even while maintaining stiff production schedules.

Erection, maintenance, attendance and lubrication costs are cut to the bone as compared with open gearing, pulleys, belts, etc. The reducers being self-contained, little floor space is required. Absolute safety and protection of operators from accident hazards is assured.

Palmer-Bee Speed Reducers are in extensive use in the paper industry. Their design includes many exclusive patented features. An interesting booklet on speed reducers and speed reducer applications is yours for the asking. Request Bulletin 279.

PALMER-BEE COMPANY DETROIT, MICHIGAN

Palmer-Bee Speed Reducers

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for alleged false arrest. Vittorio was arrested for the alleged theft of paper mill felts and was acquitted. He brought action against the St. Regis company for false arrest and recovered $500 damages, which verdict was upheld by the appellate division. The St. Regis company takes the case to the court of appeals, the highest in the state.

St. Regis Floats Bond Issue

The St. Regis Paper Company of Canada, Ltd., has placed on the security market $1,500,000 six and one-half per cent gold debentures through F. L. Carlisle & Company, Inc., and E. H. Rollins & Sons of New York, and the Northern New York Securities Corporation of Watertown.

Floating of the security issue has been expected for some time to finance the new paper mill of the company to be built at St. Augustin, Quebec. President Floyd L. Carlisle of the St. Regis Company of Canada is president of the St. Regis Paper Company of Watertown, and the other officers are the same.

The St. Regis Paper Company of Canada already owns large timber holdings in Canada, consisting of 168,934 acres, either in fee or under contract, with logging plants and equipment appraised at $3,400,000. The timber limits of the company contain over 2,000,000 cords of pulp wood, sufficient for the company's needs for twenty years. The St. Regis Paper Company was incorporated in New York in 1899, and with its subsidiary, the Hanna Paper Corporation, is the third largest group in the United States, producing 140,000 tons of paper annually. The St. Regis company controls the Power Corporation of New York, which supplied electric power to a greater part of Northern New York and has invaded the Central New York field and is linked with the Niagara system.

The appellate division of the Supreme Court of New York state has just handed down a decision in favor of the Racquette River Paper Company of Potsdam against the Maurice O'Meara Company of New York. In December, 1921, the Racquette River Paper Company brought action against the O'Meara company to recover $6,000 due on account. The O'Meara company set up a counter claim of $6,000, basing the counter claim on an alleged defective shipment of paper sold by the Racquette River company to the O'Meara company for the Cuban trade, alleging the paper was off color. The case was tried in supreme court, a judgment being rendered in favor of the Racquette River company for the full amount. The O'Meara company appealed and the appellate division unanimously affirms the findings of the lower court.

E. B. Sterling, president of the West End Paper Company of Carthage, and an officer and director of the Oswegatchie Paper Company, sailed last month for England. He will go to Edinburgh, Scotland, where he was assistant United States consul fifty years ago, in an effort to locate some of his friends of a half century ago. Joseph W. Taggart of the Taggart Brothers Paper Company, accompanied by Mrs. Taggart, also sailed for England this week. After transacting business in England for the paper company, Mr. and Mrs. Taggart will make a tour of the continent.

The St. Regis Paper Company mill at Deferiet broke its previous record of 1,097 tons for a week's production the week of July 14, when 1,108 tons were produced. Louis Martin is superintendent. There are four machines at the Deferiet mill. The largest is a 160-inch and the smallest is a 110-inch. The other two are 126 and 145 inch machines. During the week the machines averaged between 24 and 30 hours without a break.

The 100-acre tract of land owned by the Sherman Paper Company of Watertown, along the St. Lawrence river near Clayton, has been sold to a realty company and will be used for a summer colony. The land was purchased by the late George C. Sherman for use as a pulp wood terminal, but after his death the project was abandoned.

The Diana Paper Company of Harrisville reports on its inventory of June 10 that it has in its nursery 200,000 one-year-old Norway spruce trees. The company has already produced 200,000 trees, and 28,000 trees have been planted in the company's nursery this year.

The steam barge Choate, having on board a cargo of paper valued at approximately $100,000 sank in the Hudson river near Troy after colliding with a dock. The paper was bound from Hudson Falls to New York and is a total loss.

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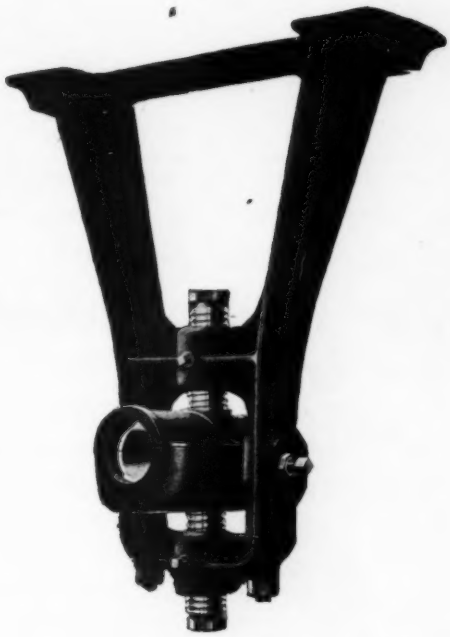

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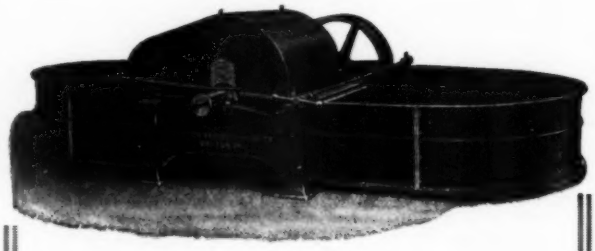

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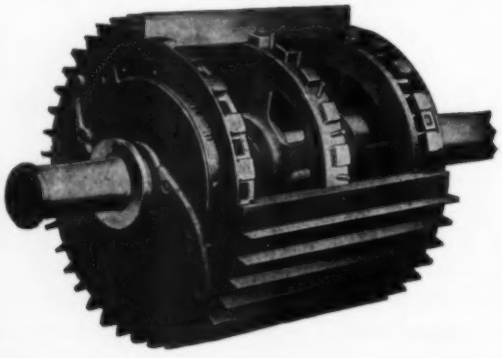

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Announcement is made that a paper box company will locate in Watertown to supply the demand of two textile factories which specialize in mail orders.

Michigan News

August 1, 1924.

Paper Industry Prospers as Quarter Ends

Despite the unfavorable industrial reports current throughout the country, Kalamazoo valley paper mills closed the second quarter of 1924 in unusually good condition and with a fair amount of orders on hand insuring operation at least during the next quarter on the present basis.

One week ago announcement was made of the prosperous condition of the three local board mills, Standard Paper Company, Sutherland Paper Company and Western Board and Paper Company. Standard at the beginning of the year increased its dividend from 6 to 8 per cent, while Sutherland has gone on a 9 per cent basis. Both concerns paid their quarterly dividends on that basis, while Western Board is reported to have paid a 6 per cent dividend in July, a semi-annual payment. Both Bryant Paper Company and Kalamazoo Paper Company continue dividends on their well-established basis of 1 per cent monthly, while Rex Paper Company paid its usual 3 per cent quarterly dividend.

Allied Paper Mills is paying dividends on preferred stock regularly but has not begun payments on the common. There is no report available on Hawthorne Paper Company, other than the statement that this concern earned its annual interest requirements the four months of the ensuing year. It is known that Hawthorne has been unusually busy the past six months.

Kalamazoo Vegetable Parchment passed its July 1 quarterly dividend of 1½ per cent. It is stated in financial circles that Parchment is pursuing a very conservative course, and having fallen a few thousand dollars short of dividend requirements the last three months, proceeded to defer payment. After considerable delay the big machine is now operating satisfactorily and from this date forward should be a big profit maker. The concern's bond department is literally swamped with orders.

Allied with the paper industry, the Kalamazoo Loose Leaf Binder Company announces an increase in annual dividends from 9 to 12 per cent, going on the latter basis July 1. In connection with that action the stock has advanced from $15 to $16.25, with none to be had.

This concern, always prosperous, has made remarkable progress the last nine months. The last annual statement, as of December 31, showed gross assets of $1,462,817.48, with a surplus of $427,334.64 and a capitalization of $981,790. The only item in the liability account, other than capital and surplus, was accounts payable (not due), $53,692.84. Against that the concern boasted cash of over $65,000, and accounts and bills receivable of $254,320.31.

Coal Freight Rates Unsettled

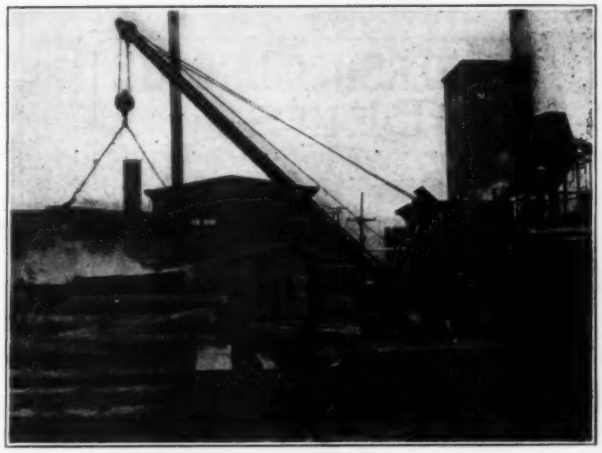
Petitions of intervention from the Muskegon (Mich.) Chamber of Commerce and Indiana coal operators were presented last month at the closing hearing on Kalamazoo-Grand Rapids coal rates before P. F. Gaul, Washington examiner for the Interstate Commerce Commission, in the United States District Court at Grand Rapids, Mich. The Michigan paper manufacturing interests and others, complainants, and the Chesapeake & Ohio Railroad, defendant, introduced witnesses.

The two interveners were heard following the presentation of the formal evidence. The Muskegon Chamber of Commerce, through its representative, W. C. Holland, traffic manager, stated that Muskegon considered itself in the Grand Rapids group and that any change affecting the latter city should affect Muskegon.

Jonas Waffle, Terre Haute, Ind., representing the Indiana coal operators, stated that any change in the Grand Rapids or Kalamazoo group coal rates affecting only coal imported from the eastern coal fields would be an unjust discrimination against the Indiana operators unless similar changes were made in coal rates from Indiana. He further asserted that there is at present a growing demand for Indiana coal in Michigan which any changes at this time would ruin.

Following the rebuttal of witnesses the examiner informed both parties that briefs in the case will be due shortly, and any other material papers must be submitted within the next month. The case will be reviewed by the Interstate Commerce Commission in Washington early in the fall.

James F. Dougherty, traffic manager of the Michigan Paper Manufacturers' Association, was put on the stand for



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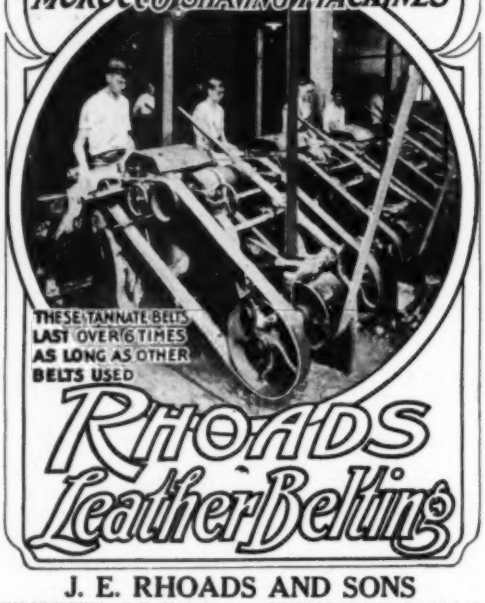

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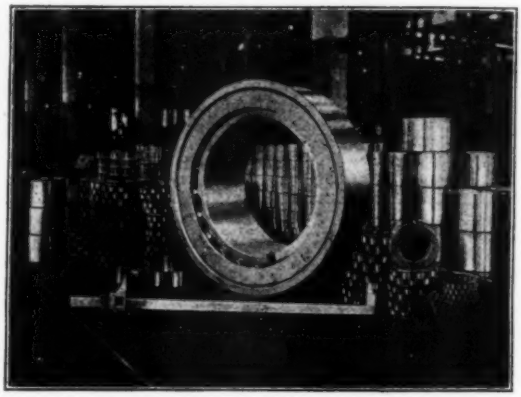

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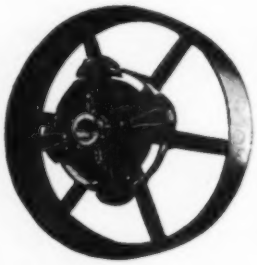

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the complainants, the Kalamazoo Chamber of Commerce, the Michigan Paper Mills Association, and the Grand Rapids Association of Commerce, Grand Rapids Paper Manufacturers and Wholesalers, and reiterated his statement that Grand Rapids and Kalamazoo coal rates are from 25 to 40 cents per ton too high. Mr. Dougherty stated that very little of the coal now used by Western Michigan paper manufacturers and others was shipped through Toledo, a statement which brought hot denial from several witnesses for the defense.

The witnesses called in the defense testified that the coal now being brought into Michigan is shipped by the most economical route and that the railroads are not making an exorbitant profit on the coal transported. They cited figures to show that the rate now being charged in Michigan is one previously fixed by the Interstate Commerce Commission, which established zone rates on all coal transportation. They further claim that the zone system of distribution would be destroyed by any change in the Kalamazoo or Grand Rapids rates. So the thing yet remains unsettled, but the Michigan paper manufacturers are putting up a unified fight and are going after reduced rates again next fall, when the case is scheduled for another hearing.

Prepared to Fight Forest Fires

Paper manufacturers dependent upon Michigan forests as a source of pulpwood supply are assured adequate protection against fire devastation this year as Michigan announces she is ready for effectively fighting forest fires. If they come this year they will find genuinely organized opposition which experienced woodsmen believe will reduce by hundreds of thousands of dollars the annual loss from forest fires in the state, pulpwood areas suffering proportionately. Pulpwood forest owners, however, in conjunction with the state fire fighting forces will make it hard for forest fires to survive this season, reports assure.

Fire towers, key men and organized fire fighting units are ready. Hundreds of persons, under the directions of the state fire warden, are prepared to check the fires as soon as they are discovered. The fire fighting machine is a distinct unit, in charge of the district warden, under whom are deputy wardens, all full time men, paid by the state throughout the year. Under them come the special wardens, engaged by the state only for fire preventive and fire fighting purposes. Each has a definite area to patrol from the opening of the fire season in April to the close in October.

Scattered through the district are volunteer fire fighters, organized by companies, engaged by the state and paid for time actually required for fire fighting. Each company is equipped with buckets, shovels and plows, and each is headed by a fire chief who receives a regular monthly retainer fee. The volunteers agree to respond to all calls to fight forest fires in their district. An important link in the chain is formed by the towermen—full time officials who are perched in 60-foot towers from sunrise to sunset on watch constantly for signs of fires, two shifts being on the job, so a 24-hour vigilance is possible. These towermen have telephone connections with fire officials of their district. Some of the towers are so strategically placed that they command as much as 400 square miles of territory. The key men are in each township, and their duties are to form a loose organization in their communities to be on the alert for signs of fire and fire hazards. These district organizations have been completed in every section of the state where the forest fire danger exists. Pulpwood forest owners and others have little need to fear the inevitable consequences of fires this year, it is said.

Kalamazoo Seeks Coal Freight Cut

Coal consumers of points in Western Michigan, notably Kalamazoo and Grand Rapids, by means of 32 tests and 104 exhibits, attempted to sustain their allegations that rates on soft coal from points in West Virginia, Kentucky and Tennessee to points in this territory are unjust and discriminatory. The contention was raised that the rate to Kalamazoo should be $2.78 a ton, or 30 cents a ton lower than the existing rate, and to Grand Rapids of $2.75 a ton, or 40 cents lower than the rate now in force.

This evidence was introduced Thursday and Friday in the freight rate case instituted by the Michigan Paper Mills Traffic Association, Kalamazoo Chamber of Commerce and the Grand Rapids Association of Commerce vs. the Chesapeake and Ohio Railroad et al. It was a case before the Interstate Commerce Commission and was held in the district court, Grand Rapids. The plaintiffs were represented

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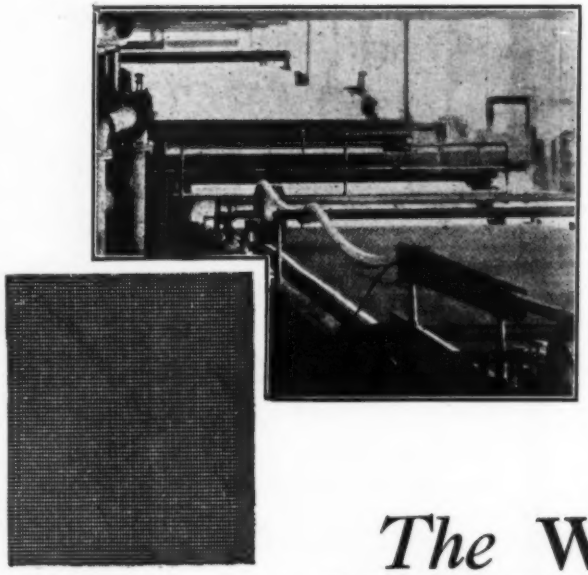

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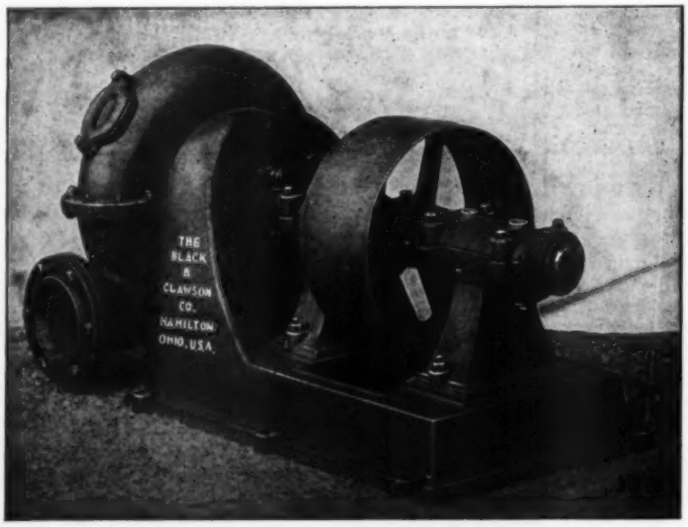

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ESTABLISHED 1873, and since we have steadily grown and stood forth as leaders in the manufacture of paper making machines and other equipment for every requirement in Board, Pulp and Paper Mills.

Our large plant and special equipment with skilled and trained help enable us to render efficient and prompt service and satisfaction to a customer.

The best is none too good. Let us serve you.

by C. R. Hillyer, Chicago, and H. F. Dougherty, Chicago; Charles H. Winslow, Kalamazoo, and Ralph Tuttle, Grand Rapids. J. S. Petterson, Richmond, Va., appeared for the defendants. P. F. Gault, Interstate Commerce Commission examiner, presided.

Evidence was introduced to show Kalamazoo used 756,000 tons of coal annually, with a trifle in excess of 400,000 tons consumed in Grand Rapids. Fully 90 per cent of this supply comes from the Kentucky, West Virginia and Tennessee fields. Kalamazoo's excessive tonnage is due to the large supplies of coal used by the paper mills.

It was further contended that a great saving could be effected if the railroads would route all coal away from Columbus, rather than by that city, Toledo and Detroit. The present arbitrary rate based on Detroit was declared to be unfair.

Among the other charges made are that the railroads are using the long route in establishing the rate basis on coal, whereas in the case of other commodities, the short route is used; again, that the coast rates from Toledo are less than those from Detroit, yet in the case of coal the rate is 50 cents a ton higher than the Detroit rate. While actual mileage is used in establishing all class rates, the forwarding roads have established a territorial basis for the rate on coal, Michigan consumers objected to that as unfair.

Pulpwood Loggers Forecast Wage Cut

Pulpwood logging operations must be conducted for less money this winter, which will probably be reflected in a slightly lower wage schedule, according to the opinion expressed at a recent meeting of the Michigan Upper Peninsula operators at Crystal Falls. The session was attended by W. E. Hollenbeck and John Flannigan of Iron Mountain, in addition to a number of loggers and paper mill executives from other districts throughout Michigan.

The conference was called primarily to discuss the logging program for the coming season, but although many subjects were discussed affecting the pulpwood industry, there was general agreement on only one: departure from the old monthly pay system of loggers.

Because of increased cost of board, increased earnings of piece workers and other changed conditions, the monthly wage is doing injustice to other important employees of the operators, such as blacksmiths, carpenters and teamsters, it was declared. It also permits the "logging hobo" to eat at the expense of the logger and then leave without doing any work.

Hereafter every woods employee will pay a daily board rate if he lives in the logging camp, it was decided. The employee will receive a daily wage out of which he must pay his board.

There seemed to be a general feeling that piece workers were being paid too much money, but in view of the scarcity of this type of laborer, there will probably be no action taken other than to make inspections of their work more rigidly exacting.

General wages in the woods will probably be lower, but, it is claimed, will be as high in proportion as the pay scales in other lines of work.

Another meeting of the operators is planned at Houghton, Mich., in the not far distant future to take action on some of the subjects brought up for discussion at the Crystal Falls meeting.

Extension Department Aids Local Mills

Kalamazoo valley paper mills have drawn heavily on the facilities of the University of Michigan engineering school during the past year, according to a statement just issued by A. E. White, director of engineering research. He announces that problems have been submitted by the Kalamazoo Paper Company, Western Board and Paper Company, Allied Paper Mills, Kalamazoo Vegetable Parchment Company, and Lee Paper Company. Other centers of activity, notably Detroit, have also made use of the department.

Members of the faculty generally are capable of supervising one investigation a year, according to Mr. White. The big problem is to find the graduate capable of doing the work on the specific problem presented. Mr. White reports that 39 separate investigations were in progress at the engineering school during April.

"Most of the larger problems undertaken in engineering research are those of corporations having a specific task to be done," said Mr. White. "For the solution of this problem it is willing to pay the amount of a fellowship for one-half

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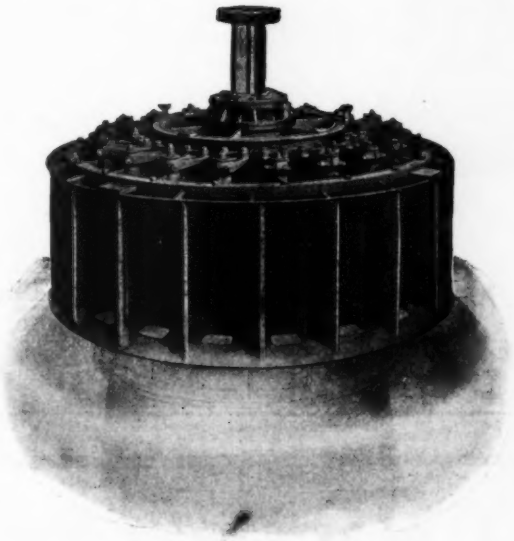

Above is shown one of ten single runner, vertical shaft, open flume type SMITH Hydraulic Turbine Units, installed in Kenora, Ontario plant of Backus-Brooks Co. These turbines develop 12,000 H. P. under 22 ft. head.

Illustration below shows one of six horizontal shaft quadruple turbine units furnished Minnesota & Ontario Paper Co. at International Falls, Minn., and which develop 15,000 H. P. under 30 ft. head.

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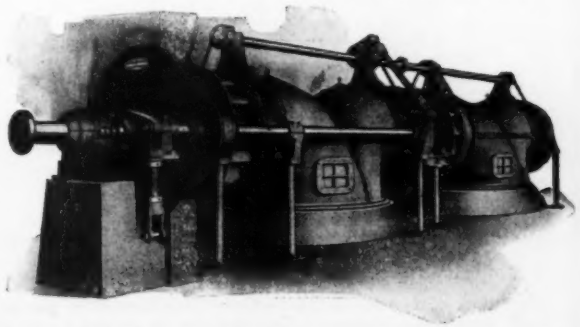

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Fig. 370, screwed, Standard Bronze Gate Valve.

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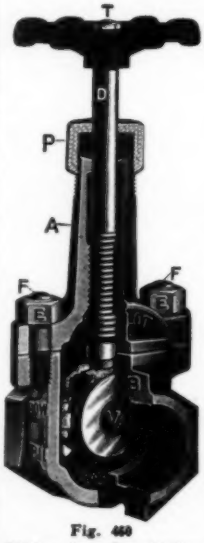

Fig. 460
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Skinner Heaters are individual units. They are effective, because of their simple scientific construction. They heat and ventilate and can be adapted to practically any type of air conditioning service. Fan operated by any power available. Use live or exhaust steam at high or low pressure.

Skinner Bros. (Baetz Patent) Heaters and Skinner Bros. Patented Direct-Fired Heaters are fully guaranteed when installed as directed by our engineers.

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J. Strange Paper Co.
Auglaize Box Co.
Adams Paper Co.
Bulis Mfg. Co.
{ United Paperboard Company
{ Installations in 12 Branch Mills }

the time of the graduate student while he is engaged in the investigation. One of the consequences of making investigations is that the man employed follows the investigation by joining the organization for which the work was done."

A notable instance of that is in the case of R. A. Hayward, who came to the Kalamazoo Vegetable Parchment Company to do special work. He remains as general manager of that concern, thus relieving President Jacob Kindleberger of an immense amount of detail work.

Building Huge Dam

The construction of a new concrete dam over the Menominee River at the site known as "The First Dam" was begun last month near Menominee, Mich., by C. E. Meyers & Company of Oshkosh, Wis., contractors, for the Marinette & Menominee Paper Company, operating plants in Michigan and Wisconsin. The dam is being built immediately below the present dam, and when completed, will extend 480 feet across the river.

A crew of more than 150 men are employed on the job which will be 22 feet through at the base and about 12 feet thick at the top, and it will contain more than 7,000 cubic yards of concrete. There will be 12 taintor gates and three overflow sections, and although the power will be increased about 1,000 horse power by the new dam the water above will be maintained at the same height as at present, the engineers point out.

The construction of the new dam will also include two new flumes and in them will be installed two Allis-Chalmers high efficiency water wells and generators of the latest type. This new machinery is to be provided with the idea of ultimately building an additional paper mill in Menominee.

The new dam will be provided with a fishway. The coffer dam construction required is extensive because of the depths of the water.

It is anticipated that work on the proposed new paper mill will be under way in a short time. A new Yankee paper machine is to be installed there, it is said.

Strike in Labor Union Row

The Filer Fibre Company, of Manistee, Mich., are having labor union troubles. Although their 225 employees met after they walked out, about the middle of July, no solution of the walkout has been proposed. The men went out because the management refused to discharge a foreman who would not join the union recently organized in the Manistee plant.

The company has obtained an injunction against the new union, its organizers, officers and associates, restraining them under a $10,000 individual penalty from molesting or in any manner interfering with the work of the new employees who are being brought into the plant.

Since the strike took effect mild sabotage against the strike-breakers has developed; especially is this true since they have been coming in large numbers. With the arrival of a troop of state police in that vicinity, however, the situation quickly became normal, and now the injunction prevents even aggressive picketing.

The company expects to be operating full force again soon.

In addition to labor troubles, the company has recently experienced opposition to drifting pulpwood bolts down the Little Manistee River, but the walkout seems to be the final chapter in a series of unforeseen difficulties.

Three Board Mills in Valley Busy

Despite the general depression in the board industry throughout the country, the three Kalamazoo mills are enjoying an unusually excellent run of business at this time.

Winship Hodge, general manager of the Western Board and Paper Co., reports his plant is heavily booked with orders both for immediate and future deliveries and that any appreciable delay in shipments is regrettable.

While both mills of the Standard Paper Company have been down the last week in June, John F. Byrne, manager, reports that that was done to make certain necessary repairs and changes in the machines. In the meantime the carton plant is running full and has a fine line of business booked ahead.

The Sutherland Paper Company is operating both mill and carton plant full time while work is being rushed on the addition that will double the capacity of the latter division. This concern has been very busy for the past six months, and there is no indication of any depression in the immediate future.

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wet places,
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—an ideal belting for paper mill drives
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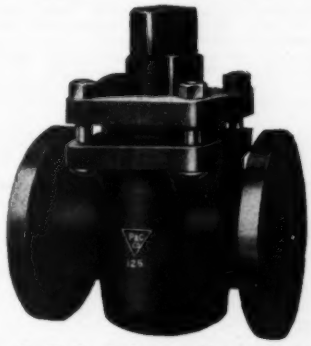

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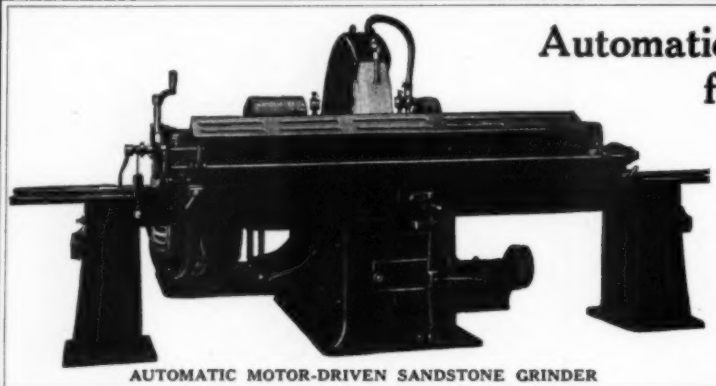

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Straight Wheel, Cup Wheel, Ring Wheel, Sectional Wheel Grinders; Automatic, Semi-Automatic and Hand Machines; for every variety of service.

Write for circulars covering latest developments in paper knife grinding.

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Peerless

Friction Clutch

With the Peerless Positive "V" Stop

A clutch designed for use on Globe or Cylinder Rotaries, furnishes positive power for starting the equipment; and absolute stopping for loading or unloading.

All parts are made of high-grade material, accurately machined and fitted.

This clutch is made in a number of sizes. Write for further information, or send us complete specifications and clutch will be shipped at once.

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Have You Run Them?
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FELTS and JACKETS

Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

They Satisfy

End of Paper Price War Seen

The decline of paper prices is nearing an end, according to Fred Weissinger, secretary and sales manager of the Dudley Paper Company, Lansing. He gave expression to this opinion at the general sales conference of the concern, which was held in Lansing Friday. He says that no sharp upturns can be expected and that on certain lines there may be further slight decreases, but as a rule price quotations are being stabilized and a substantial recovery is predicted before the end of the present year.

Consumption of paper in the company's territory is on the increase, he says, indicating that manufacturers are resuming and their payrolls increasing the buying power of the public. Paper stocks are generally low and must be replenished, which would indicate both active production and buying in the immediate future.

Branch managers and representatives from Saginaw, Bay City, Traverse City and Battle Creek attended the conference in the general office.

N. M. Brisbois, superintendent of the Board Division of the Sutherland Paper Co., has accepted the position as manager of the paper company at Stockton, Cal. In his stay at Kalamazoo, Mr. Brisbois has been very active, being president of the Michigan Division of the Superintendents' Association and the first president of the Harmony Club of the Kalamazoo Chamber of Commerce, organized to give employers of labor a closer insight in labor questions, and cut labor turnover. Mr. Brisbois is leaving at once to take up his new duties.

The research work on the reburning of lime sludge from sulphate mills was recently completed by Prof. A. H. White of the University of Michigan, for the Kraft By-Products Association, composed of a number of mills in Wisconsin and Minnesota. It is now planned to install a plant at one of the mills to carry this out. Much interest has been shown in the recovery of sulphate by-products. Turpentine of good quality is now being produced, but as yet alcohol and rosin oil have not been successfully produced on a commercial scale.

The Elam Paper Company, Marion, Ind., in which Kalamazoo capital is interested, is in the hands of a receiver, the Farmers' Trust and Savings Company having been named by the court on application of a large creditor. The company has filed its written acceptance. In the petition for a receiver the assets are placed at $200,000 and the liabilities at $350,000.

On August 16th, the 3rd annual picnic of the Bryant Paper Company will be held at Long Lake. The committees have been appointed and everyone is working to make this the biggest picnic that the mill has ever had.

Wisconsin News

August 1, 1924.

Northern Paper Floats Bond Issue

The Northern Paper Mills Company of Green Bay, Wisconsin, are floating a $675,000 bond issue. These are First and Refunding 6½% Serial Gold Bonds.

These bonds are protected by security amounting to $3,421,000.00 as follows:

Plant and Property at Green Bay at Cost	$2,596,296.93
Dock and Site at Green Bay	60,950.00
Water Power on Menominee River	350,000.00

4,806 acres of timber at Ontonagon County, Michigan, at cost plus interest on original cost $311,773.79.

Stumpage and logging operations of Sawyer-Goodwin. Cost less depreciation and depletion $101,974.52.

Fixed assets under the mortgages amount to over 3 times the outstanding bonds of $1,100,000.00.

These bonds have been given a Class A rating by the Wisconsin Railroad Commission.

The active management of the company is in the hands of Mr. W. P. Wagner, former president of the Citizens National Bank of Green Bay, and Mr. Judson G. Rosebush, treasurer and general manager of Green Bay who is also an official of the Nekoosa Edwards Paper Company, Inland Empire Paper Company, Patten Paper Company and Craig Mountain Lumber Company. The company has insured the life of Mr. Judson G. Rosebush for $425,000.00 for the benefits of its creditors.

For the last 8 years, net profits before interest, depreciation and federal taxes were $2,291,862.96 or an annual aver-

The Armstrong is all steam trap

EVERY part of the Armstrong Steam Trap is a *vital* part. There are no auxiliary parts; no bulky copper floats, baffle plates, counterweights, cocks, diaphragms, or other complications.

Your money buys a simple, fool-proof, trouble-free mechanism finely built of the highest quality of material, but low in price because of its sensible simplicity.

The principle behind this simplicity is that widely praised Armstrong feature—the inverted, submerged bucket. It is a feature that is widely recognized in the paper industry.

The action of this bucket insures quick opening and closing of the valve. There is practically no scoring from wire drawing and there can be no steam leakage.

Sediment oil and other foreign matter are first to leave the trap when it discharges.

Air binding is totally eliminated by the hole in the closed end of the bucket. Air passes through this hole, rises to the top of the trap, and passes out with the discharge—typical Armstrong simplicity. If you want to know more about the little trap of big capacity ask for a catalog, or—better still—a 90-day demonstration.

Armstrong Machine Works
322 Steam Saving St.
Three Rivers, Mich.

The Standard Armstrong Trap is furnished for pressures from 0 to 300 lbs.—for service on vacuum where inlet pressure is greater than outlet pressure — for draining water from compressed air expansion tanks, separators, etc. — for service on grease. The Armstrong Special is furnished for pulsating pressures.

Armstrong Steam Trap

Your jobber will get Armstrongs for you

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Only a Drop in the Bucket!

A SINGLE Fourdrinier Machine, with the building necessary to house it, and power required to operate it, can easily represent an investment of a million dollars.

Why reduce the profits from this huge investment by using other than the best Fourdrinier Wire obtainable?

The slight difference you pay for a quality Fourdrinier Wire is only a drop in the bucket, but, on the basis of profitable returns, no investment is more profitable.

To realize the value of long-wearing Tyler Fourdrinier Wires, figure the cost per hour of an idle Fourdrinier Machine, including interest, depreciation, loss in time, labor and production.

A Tyler "Quality" Fourdrinier Wire is an investment in increased output, in maintaining standards of quality, in lower production costs, and in increased profits.

Let us send you samples of Tyler Fourdrinier Wires so that you may see the accurate, uniform weave—feel its smooth, even surface—test the strength of the special wire from which it is woven.

THE W. S. TYLER COMPANY, *Cleveland, Ohio*

TYLER FOURDRINIER WIRES

CYLINDER WIRES BACKING WIRES WASHER WIRES CORDUROY WIRE CLOTH HUMMER ELECTRIC SCREENS

"HALLOWELL" Steel Truck Platform

Pats. Pending

For ruggedness, strength, serviceability and long life specify the "HALLOWELL." Made in all sizes and for all kinds of service.

Other lines of our manufacture used in plants of the paper industry, also as parts of machinery for this trade, are:

"Pioneer" Steel Shaft Hangers

"Hallowell" Steel Bench Legs

"Hallowell" Steel Shaft Collars

"Standco" Socket Head Cap Screws

"Standco" Hollowset Screws

Standard Pressed Steel Co., Jenkintown, Pa.

age of $296,482.87. The annual interest charges on $1,100,000 bonds are $69,375.00.

The bonds at the present price yield about 6.75%.

Convention of Wis. Federation of Labor

Over 200 delegates of the Wisconsin State Federation of Labor attended the annual convention of that body which was held in Wisconsin Rapids, Wisconsin.

The meetings were beneficial as matters were taken up relating to the welfare of their members.

On Wednesday, July 16th, the delegates visited the plants of the Consolidated Water Power and Paper Company, where they viewed two of the country's fastest newsprint machines.

Among the things drawn up by the resolutions committee was one asking for fire prevention education to protect the forests of the state.

There were a number of representatives of the different pulp and paper mills whose mills are unionized.

All of the employees of the Consolidated Water Power and Paper Company are affiliated with the American Federation through the different branches of Paper Mill Workers, Sulphite Mill Workers, Electrical Workers and other branches taking in the different trades.

Mr. Geo. C. Schneider, an officer and organizer, who organized the Consolidated Mills was present at the meeting.

A banquet was held on Thursday evening when the delegates were the guests of the Wisconsin Rapids Central Labor Union. There were many business men present at the banquet, and many of the Union officials gave addresses.

Mr. G. W. Mead, president of the Consolidated Water Power and Paper Company was also a speaker. He traced the development of the city from the lumbering days until the present time, declaring that Wisconsin Rapids had never had a boom, but was not subject to industrial depressions as other cities. He then discussed the time five years ago when there was a demand for organizing the paper industry and he spoke of his experience at that time.

"About five years ago our company took on the unions after a very careful investigation. It was an important step to our company and our stockholders. I said at that time that I would take it on and try it out and if it was as it was represented, we would agree to retain the relationship," Mr. Mead stated. He then gave his testimonial as to the successful relationship between employer and employee under the organized shop arrangements, saying that he was happy to give the testimonial after only five years of experience. Then he had promised himself that he would not make statement nor form opinions until a period of seven years had elapsed. Now he said he could recommend the unionizing of industry to other employers. The militant stand of labor held in the past was unnecessary now as Mr. Mead predicted that the unions would assume more confidence of the public because of a sincere purpose to do good and make a just and righteous growth. His many statements pertaining to labor and to Wisconsin were met with applause.

Large Number of Dams in Wisconsin

According to a report just made public by the Railroad Commission of Wisconsin there are 609 river dams in Wisconsin. Of this large number the greatest percentage are those for private purposes, and most of these dams are used to develop power for use in the manufacture of paper or pulp.

Three hundred and thirty-five of the above are used exclusively for power for private interests, most of which is for the paper industry, 100 for power purposes for public service, and 23 are used jointly as power dams for private and public service purposes.

Electric power is generated at the 100 dams, and while a good deal of this is for public use, there is also a good deal of this used by different pulp and paper mills which are tied in with the different public service corporations which serve Wisconsin.

In addition to the above there are 115 dams not utilized for power, but used to create storage reservoirs for the regulation of flow of water. It is necessary that the different mills have as constant a flow of water as is possible and especially on the Wisconsin are there a number in the northern part of the state which store up surplus water which is released during the winter and summer low water periods depending when the shortage occurs.

The Wisconsin River according to the report develops the most water power, and it will be remembered that there are an exceedingly large number of pulp and paper mills in the Wisconsin River Valley.

A Paint That Meets Paper Mill Needs

BITUMASTIC SOLUTION is made expressly for industrial purposes and, as a paint for metal surfaces, is unexcelled. It withstands moisture, acid fumes and high temperatures, prolonging the life of costly equipment.

BITUMASTIC SOLUTION gives a hard, brilliant finish. It is easily applied and dries quickly.

There are many uses for BITUMASTIC SOLUTION throughout a paper mill. Wherever there are steel surfaces its use will be the means of preventing rust and cutting down maintenance costs.

A trial will fully convince you that BITUMASTIC SOLUTION is the proper paint for much of the work in your mill. Therefore, we shall send a sample for trial purposes free if you will send in the coupon below.

Send in the coupon today—and give it a trial.

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Located in the heart of a prosperous and settled industrial community of 165,000 people. Directly on Rock Island R. R., with spur track and six large loading doors. Five trunk line railroads give quick and economical access to all the important market centers of the Middle West and Northwest.

Ideal in layout and location for a district warehouse, for wholesale grocer or druggist, or for manufacture of paper products, garments, etc.

Modern brick construction. Six stories and basement, 115 x 132 feet. Approximately 102,000 square feet of floor space. Two-ton freight elevator to all floors. Heavy factory construction; floors built to carry 250 lbs. per square foot.

Labor supply is ample and intelligent at advantageous rates. Turnover very low No labor trouble in 20 years.

Building must be sold at once to liquidate a business. Will sacrifice to first taker. Careful inspection invited. Write or wire for full details and photographs.

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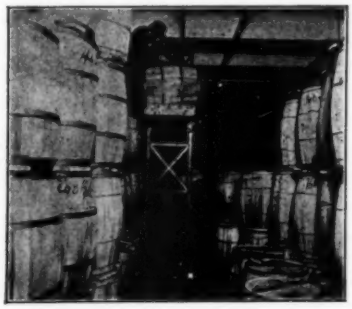

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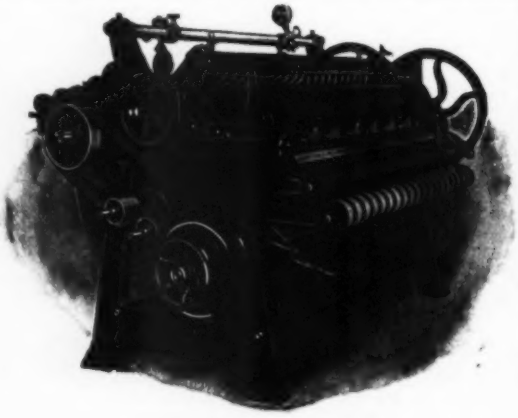


PAPER CUTTERS

Single, Duplex, and Diagonal

CUTTER KNIVES
PATENT TOP SLITTERS

Hamblet Machine Co.
LAWRENCE, MASS.

IF YOU USE CHAINS USE UNION CHAINS

"The Chain of Double Life"

THEY GIVE LONGER SERVICE PER UNIT OF COST

The bridged steel link insures strength and permanency. The large case-hardened pins and bushings, both reversible and renewable, insure durability and economy.

We can fill any of your requirements for elevators and conveyors, roller chains, bushing chains, attachment links, cast, cut, and renewable tooth sprockets.

Let Us Have Your Inquiries

THE UNION CHAIN & MFG. CO.
SANDUSKY, OHIO

New Plant of Riverside Co. Started

During the latter part of July the new mill of the Riverside Paper and Fibre Company of Appleton, Wisconsin, was started, and paper was made for shipment to this mill's customers.

This plant was completed some time ago, but was not placed in operation until everything was in readiness and all final adjustments had been made.

The machinery that was in the old building is being taken down and moved to the new machine room, and the old plant will be torn down as soon as all of the machinery has been removed.

Ledger papers and sulphite bond is being manufactured in the new mill.

Changes have been made in the sulphite mill to increase the efficiency of that mill, and new stokers have been installed in the boiler room.

The new mill of the Riverside Paper and Fibre Company is one of the finest in the Fox River Valley, and is exceptionally well lighted and ventilated.

This plant is one of the few mills in the Fox River Valley that is operating 24 hours a day, every day of the week, only closing down on Sundays. Most of the other mills in this valley have been curtailing production, either by shutting down one or two days a week, or by slowing down the machines.

Out for New Record

The Niagara Mill of the Kimberly Clark Co. at Niagara, Wisconsin, is out for a new safety record.

In 1923 this mill completed the year with only five lost time accidents for the entire year. This is thought to be a world record for safety in paper mill work. The mill ran 150 consecutive days without accident, or a little more than 23 weeks.

Everybody is working to establish a new record. Letters are being distributed to each employee asking that he be especially careful during the remainder of the year. New bulletins have been issued and committees from different parts of the mill are pushing the safety work in their respective departments.

One department is trying to beat the other and they are going at it rather as a game and scores are counted against the department having the accident.

Each superintendent is teaching his foremen, who in turn are turning over the instructions to his men so that the year 1924 will be a banner year.

The officials of the Kimberly Clark Co. have always been among the leaders in safety work, and have taken a great deal of interest in this work in all of their mills.

Kimberly Clark Starts New Work

The Kimberly Clark Company of Neenah, Wisconsin, are working along lines to help their employees better their education.

They have started a new education department in the mill at Kimberly, Wisconsin, and this is to be directed by Mr. A. S. MacArthur. Mr. MacArthur has done considerable work along educational lines for the men in the Niagara plant of the above company. He was head of the Niagara high schools for 7 years.

With the addition of this new department men in the employ of the company will not only be able to advance their education, but also will be fit for positions of advancement.

Mr. MacArthur had 11 years of successful public school teaching experience together with a good education, and these with the friendship he has formed with the men in the organization it was a good selection made to organize this new work.

Takes Water Away from Couch

A device known as Cramer's Suction Slice, manufactured by C. E. Cramer, 125 Main street, Hackensack, N. J., takes the surplus water away as the couch presses it out. By bringing the sheet to couch as it is formed, considerable more speed can be obtained, and taking the surplus water away does not give the dirt time to become lodged in the felt; therefore, it keeps the felt cleaner and the felt runs longer.

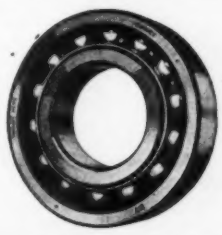
The slice should be connected with about six feet of suction hose and a union, so that it may be taken off quickly to clean any time it is necessary to wash up. By having a valve in the suction line, it can be regulated to any amount of water to be left on the felt. The device can be cleaned quickly with the steam hose that is used to blow cylinders with.

GURNEY
BALL BEARINGS
—in Electric Trucks
Mean Increased Efficiency

GURNEY BALL BEARINGS are used in this truck, made by the Buda Company, as they have given the desired results—greater capacity, less friction, easy starting and running, safety, endurance, minimum power consumption and freedom from repairs, all characteristic Gurney features.

Let our bearings help you eliminate any difficulties you are now having with bearings of other types. Our engineering department is at your service.

18254

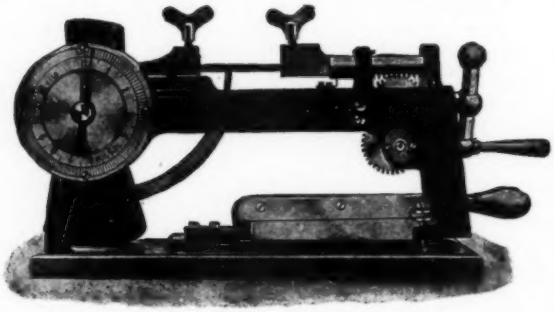


Marlin-Rockwell Corp.
JAMESTOWN, N. Y.

Poller Paper Instruments Insure Accuracy

Paper Tester No. 400

Indicates accurately tensile strength in pounds and percentage and stretch in inches and percentage—all in one operation. Temperature makes no difference. It is the "Supreme Court" of all testing machines. No springs to get out of order. No glycerine or rubber discs to replace. All numerals are in English units and not in Continental Metric system.



Paper Tester No. 399

Indicates breaking or tensile strength of paper. Operated by means of gears and screws. No springs to weaken and influence results. This machine is portable, weighing less than five pounds.

Pocket Micrometer

Handy pocket gauge for paper or board. Very accurate

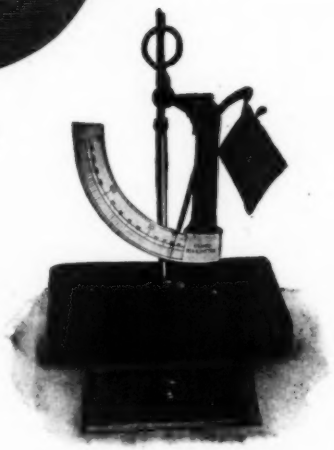
Automatic Micrometer

Measures thickness of board and paper accurately. Best instrument on the market for this purpose.

Paper Scale

Indicates ream weight 24x36—480 or 500.

These scales are furnished for weighing a full size sheet, 24x36, or a small piece. Both will indicate ream weight by direct reading. No springs.



Pocket Scale

For coarse or fine papers. By weighing a piece 2½x3¼ the standard ream weight is accurately shown. Very accurate and reliable. Weighs less than one pound and can be carried without inconvenience.

Sole Agents for the United States and Canada for Poller Instruments

THE UNION SELLING COMPANY

PAPER AND TWINE

210 Walnut Street, Cincinnati, Ohio

Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

New Dehydrator for Mechanical Wood Pulp

IN THE Scandinavian countries mechanical wood pulp comes on the market containing 50 per cent of dry substance. Such pulp can easily be disintegrated in the beater. The dehydration is accomplished on the ordinary dehydrating machine and the pulp is thereafter pressed in hydraulic presses. This means two separate operations. In the effort to make the process more economical, the Karlstad Mekaniska Verkstad has constructed a machine which gives the product the 50 per cent dry condition in a single operation.

The machine resembles in some respects a filter press. The stock is permitted to run in strongly diluted condition on an endless wire and is dehydrated between two endless wires in a press which is provided with grooved press rolls. The water content is reduced thereby to 70 per cent. Then the pulp is carried over to a felt, as is done in the paper making machine from the couch roll to the wet felt, and is then passed between two endless wires into a second press, provided with grooved rolls. There the moisture content is reduced to 50 per cent. The rolls in the press are not only provided with grooves, which has a strong dehydrating action on the pulp, but are also furnished with suction pipes which produce a vacuum and serve to assist in the removal of the water. The machine is also provided with cutting devices so that the sheet of mechanical pulp can be cut into the desired size.

In a machine whose working width was 1,800 millimeters, the production was 18 tons of the dry pulp in 24 hours. The speed of the machine was at first 16 meters per minute, but can be increased another 10 meters per minute. The pressure exerted was 5 to 10 kilograms per centimeter width of the sheet of pulp in the case of the wire, 50 to 55 kilograms per centimeter in the case of the felt. The vacuum was about 1,850 millimeters of water on the wire and 400 to 500 millimeters of water on the press. Wochenblatt fuer Papier-fabrikation, 1924, number 21.

Paper from Bamboo, Bagasse, Etc.

THE utility of bamboo, bagasse, papyrus and the like for the manufacture of paper is considerably enhanced if the raw materials, prior to digestion, are reduced to a substantially standard quality (for each class of material treated) of pecto-ligno-cellulose by removing hydro-mechanically the non-fibrous pithy constituents. The process is conveniently carried out in an apparatus which resembles in general construction a potcher, fitted with a drum washer and provided at its base with a grid for the removal of the pithy material. The raw material, previously opened up, is cut into short lengths from one to three inches, and is then beaten for fifteen to twenty minutes in this machine with the roll set to a "brushed-out" position. The grid is then opened and the precipitated parenchyma, and in the case of bamboo, the node material is removed.

After a further 15 to 20 minutes when the effluent from the drum washer is clear, the pecto-ligno-cellulose pulp may be either removed and baled, with or without drying, or converted directly into ligno-cellulose by treating it with three to six per cent (on the weight of the air dry material) of caustic soda or five to twenty per cent of milk of lime at a temperature above 55 degrees C. The heating is carried out with steam, which is preferably introduced through a slot in the base of the washer immediately in front of the bedplate. Further digestion of the stock may be carried out in order to remove the lignin.

The resulting material requires from six to eight per cent of bleaching powder and the average yield of bleached pulp is 42 per cent on the air dry weight of the bamboo culms. This process may be economically applied for the combined treatment of bamboo and bagasse, the pithy matter from the bamboo being used as fuel in the extraction of sugar from sugar cane. The residual bagasse is then reduced hydro-mechanically with the recovery of further quantities of fuel. The effluents or spent liquors may be treated for the recovery of the solids contained therein which may be used for fuel or for fermentation.

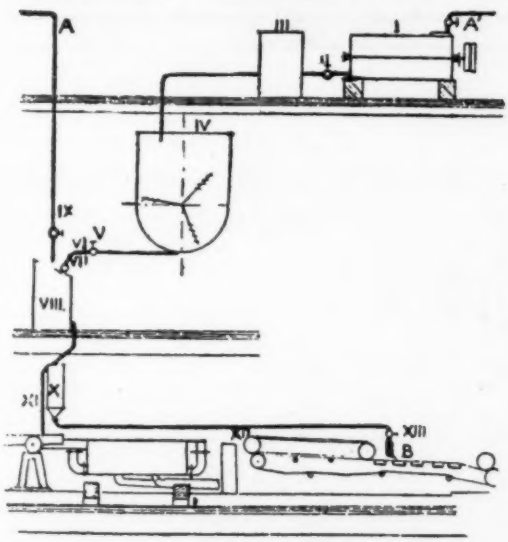
This process is patented in British Patent No. 213,003.

Addition of Filler While Forming the Paper Web

THE following diagram illustrates a process which was carried out in a Finnish paper mill, in which the filler was added to the paper during the formation of the web. The purpose of this process was to reduce the loss in filler which always is present in paper mill operation where the loading materials are added to the beaters and incorporated with the stock.

The filler, whatever it happened to be, was mixed with from four to five times the weight of water in the mixing tank (I). Then it was run through a vertical screen arrangement shown at (III) into the storage tank arrangement (IV). In this tank the suspension of filler and water was stored until ready for use. This tank had a capacity of 24 hours' supply of filler and was equipped with stirrers in order to to keep the solid particles of filler in suspension in the water.

In order to regulate the flow of the filler to the paper web, two measuring vessels, shown at (VIII) and (X), were employed. These were provided with sieves and the suspension



of filler, for example kaolin, was further diluted with water which entered through the water pipe (A), which was itself controlled by the valve (IX). In this manner the quantity of filler added to the paper web can be regulated so as to be suited to the manner in which the paper making machine is operated.

The filler distributor consists of a wooden or metal box, the width of the paper web, which possesses a horizontal slit, extending the width of the box on one side. The width of the opening can be regulated. In this way the proper amount of filler can always be added to the paper with but little trouble. The position of the distributing box can also be located at such a point so as to give the desired results.

When the addition of the filler, in accordance with this arrangement, is made near the suction box, results in but little loss of filler but on the other hand there is danger that the

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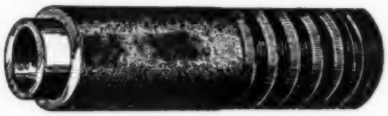

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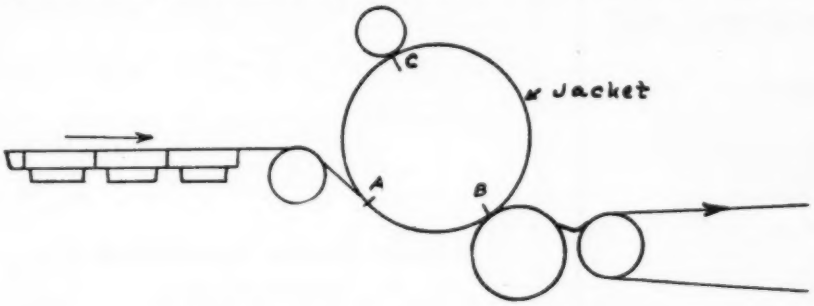
paper will be filled on one side only. Paper containing from 2 to 25 per cent ash has been made by this contrivance.

Suction Couch Roll

THE figure which is given below shows the arrangement of a suction couch roll which is intended to take the place of the ordinary couch roll.

The top roll is made with a brass cover which has holes closely set together all over the working surface and is covered with a jacket in the usual manner. A discharging apparatus is built within the roll for the incoming water and a vacuum of from one to six meters of water is maintained inside the roll by means of a pump which draws through hollow trunions. Inasmuch as air can only enter the roll through the jacket, the latter is quickly sucked dry.

In the ordinary couch roll, the jacket absorbs water between the points (A) and (B) and this is pressed through the sheet at the point (B). The suction couch roll jacket also absorbs water in still greater quantity between the same points, but at the point (B) it is mostly sucked into the roll, and from (B) to (C) the jacket is sucked dry. In front of the guard board or roll, clean water is sucked through the jacket so that



it remains clean. From (C) to (A) the jacket is again sucked dry and ready to absorb water from the paper web. Not only does the roll suck, it also presses at the same time, so that the sheet becomes drier and hence the pressure that is applied upon it can be greatly increased without damage to the paper. The ordinary suction boxes may accordingly be relieved of a considerable amount of work and the wear on the wire is correspondingly reduced. The power that is required is so small that big pumps are not necessary, and, in some instances, the pumps already serving the suction boxes have proved to be able to take care of the roll as well.

It is claimed that the ordinary inherent couch roll troubles are removed by this arrangement. The jacket does not slip on the roll, nor twist, nor run to one end, and hence, the annoying wool knots do not form between the jacket and the roll. The jackets last longer, production of paper is increased and there are fewer breaks due to the couch roll. The World's Paper Trade Review, 1914, page 1776.

Manufacture of Cellulose

FINELY divided wood from which the resin has been removed is treated with fifty times its weight of ten percent sulphuric acid, and sodium chlorate and oxalic acid are added. Sufficient chlorate is employed to generate enough chlorine dioxide to remove all the lignin present. The process can also be applied to purifying cellulose from lignin. The results are as good as, and the process is more easily applied than when the chlorine dioxide is generated outside of the vessel which contains the cellulose. The action of the gas is controlled by regulating the temperature of the mixture. German Patent No. 388,343.

Ageing of Rubber Latex Paper

THE subject of latex paper is always interesting, for the question is still a much mooted one as to the advantages that are gained by the addition of rubber latex to the pulp and the manufacture of a latex paper from the mixture. Experiments have been carried out with the idea in mind of determining the ageing of latex paper.

For this purpose paper which had been prepared with rubber latex was cut into strips and extracted for 48 hours with a mixture of acetone and five per cent of acetic acid in the proportion of one liter to 100 cubic centimeters. This paper was then extracted with chloroform for the same period of time. The soluble matter that was removed in this manner represents the content respectively of resinous matter and rubber. Any turbidity of the chloroform extract is indicative of resins which had escaped the first extraction; these are removed from the rubber by washing the dried extract with acetone.

Successive analyses of the same paper reveal a rapid oxidation of the rubber, particularly in the case of paper made from sulphite and soda pulp, in sample of which the rubber content fell from 1.5 per cent to 0.02 per cent in a period of twelve days. The rubber in a rag paper was more resistant. The proportion decreased from 0.6 per cent to 0.24 per cent in six months. India Rubber World, volume 68, pages 561-2.

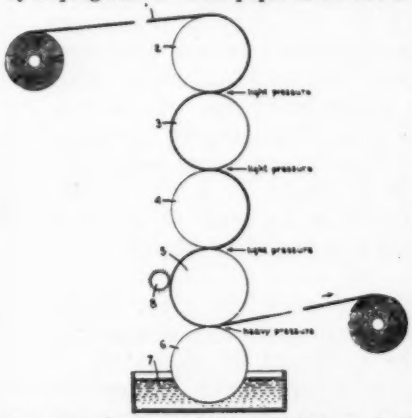
Improvement in Dandy Roll

IN THE ordinary form of dandy roll, the outer surface or cover of woven wire cloth or laid wire sheet displaying a water mark repeated a number of times or a number of different water marks, has commonly been made in one piece. In such a construction it was, as a rule, necessary to have one complete dandy roll for each of the required water marks, or to remove the wire cloth or laid wire sheet, and substitute another.

According to the invention, which is patented in British Patent No. 214,215, a dandy roll comprises a number of interchangeable sections available for different water marks, secured in position on a tube or shaft. In one form of construction, each section comprises a tube upon which the necessary disc plates, supporting wires, and cover for a wove roll, or the laid sheet, in the case of a laid roll, are arranged. Inside each end of each tube, there is secured a brush or collar having one or more keyways in its inner surface. The brushes and keyways accurately fit upon a tube extending across the paper-making machine. The latter tube may be conveniently plugged in the usual manner. In operation the various sections required are slid into position over the inner tube and held in position by a nut or other suitable device. In a dandy roll, which is constructed in such a manner, each individual section forms a complete unit which can be brought into use or replaced as required with a minimum amount of trouble, and without risk of disturbing or damaging the outer surface or cover of the roll upon which the details of the water mark are displaced.

Impregnating Paper

UNITED STATES Patent No. 1,501,493 is concerned with a process for the manufacture of a tough, durable paper by impregntaion. This paper is formed from a stock without any sizing, then the paper is calendered with a light pressure and then with a heavy pressure, and finally the paper is impregnated with a strengthening solution and subjected to heavy pressure calendering. The calendering process is conducted in such a manner so as to leave the paper open and porous, and then the paper is perforated and impregnated with the strengthening solution which is made from casein.



Improved Beater

THE invention which is patented in British Patent No. 208,371 relates to beating engines for paper pulp and the like, of the type in which bars on a revolving beating roll coöperate with a bedplate or bedplates which are located in any position around the beater roll, the pulp being circulated in the trough which communicates with the beater roll and is usually shaped to carry the beater roll and bedplate.

Heretofore, in beaters of this type, the pulp is circulated over the top of the bedplate, across the bars of the same and

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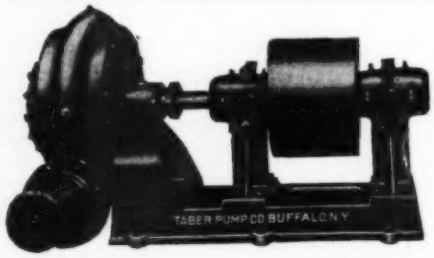

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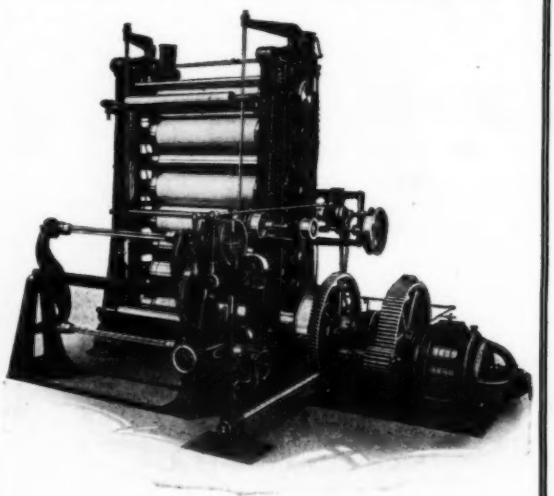

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between the bedplate and the roll in one continuous mass. It is then ultimately discharged by the bars of the beater roll into the trough.

According to the present invention, the bedplate is subdivided transversely into groups or sections of one or more bars each and the pulp is circulated through the spaces formed between the bars or groups of bars of the bedplate. This arrangement insures that each bar or groups of bars in the bedplate is supplied with pulp for beating, so that the pulp supply is sufficiently and more uniformly distributed to the several bars of the bedplate.

The beater roll may be fixed or adjustable to and from the bedplate in the known manner and the vat or trough may be of any suitable shape. Preferably the beater roll delivers the pulp in known manner over a curved guide to the vat, which may have a slightly sloping bottom towards the back of the bedplates, so as to facilitate the circulation of the pulp.

By using a pump system of circulation, the bars or groups of bars may be situated in any position on the periphery of the beater roll, that is to say, either below or above the beater roll or in any intermediate position.

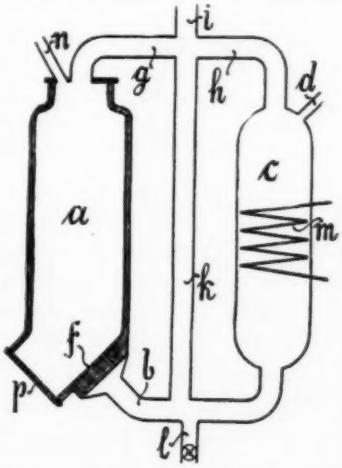
Action of Chlorine and Chlorine Dioxide on Wood

PART of the article that is published in the German journal, Cellulosechemie, volume 4, pages 101 to 109, is concerned with a discussion of the accuracy of various methods for the determination of the cellulose and incrustating materials in wood. Various methods, such as the Schmidt-Graumann, the Cross and Bevan, the Willstaetter, Zechmeister, are described and compared for accuracy.

Manufacture of Chemical Pulp

A PROCESS for the manufacture of chemical pulp from wood is carried on in the apparatus which is indicated in the accompanying figure. The digester (a) is provided with an auxiliary container (c) which is connected therewith by the pipe (b). In this auxiliary container the digestion liquor is maintained at a temperature between 110 and 120 degrees C. After the digester (a) is filled with stock, it is closed and pressure is introduced through the pipe (d) into the container (c). The pressure medium may be either steam, gas, air, etc. The pressure then forces the liquor through the grating (f) into the digester (a), and the liquor is made to penetrate through the chips of wood that are found in this part of the apparatus. The gas pressure which is evolved in the digester (a) can then be released through the pipes (g), (h), and (i) and (k).

In using steam for this purpose, a certain advantage is gained in that the loss of heat through the cooling off of the liquor is counterbalanced by the addition of heat in the form of steam. On the other hand, the liquor in the container (c) may be heated by means of the set of coils (m). The pipe (l) is for the running off of the spent liquor after the digestion process.



After the digester (a) is filled with liquor, the introduction of steam through the pipe (d) is stopped and the steam connection (n) at the top of the digester is opened and liquor is made to flow back from the digester (a) into the container (c). This mode of operation is continued until the digestion process is completed. After digestion is completed, the total quantity of liquor in the digester is forced over into the container (c), and then the cover (p) at the bottom of the digester is opened and the digested stock is removed by means of a current of compressed air. It is found that both the time of digestion is reduced in this type of digester and the yield of pulp is increased, compared with ordinary types of digesters.

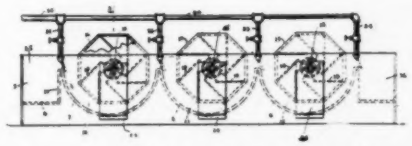
The process and apparatus are patented in German Patent No. 391,267.

Figured Cardboard

A NEW British invention is concerned with the manufacture of figured cardboard. When in a soft or moist condition the cardboard is sprinkled with a convenient figuring mass, which may be cellulose or any fibrous material, for instance the fibers of rags, wool or straw. This is done prior to the compression of the cardboard. The fiber mass is preferably mixed with water and sprinkled on the cardboard, which, with the cloth, is submitted to pressures at about the same pressure as it required to produce hard cardboard. The fibers are thus pressed into the cardboard and produce upon it a marking which is more or less regular according to how the fibers have been sprinkled upon the cardboard and according to the color of the fibers themselves. The mixture can also be sprayed upon the cloth to be transferred thence to the cardboard or both procedures can be used. The mass for figuring can be applied by hand or mechanically. After the application of pressure, the cloth can be easily removed without tearing off the figuring. The cardboard is subsequently dried in the usual manner.

Paper Pulp Cleaning Apparatus

THE pulp washing apparatus, which is patented in United States Patent No. 1,498,716, comprises a compartment which has a curved wall for receiving the mixture of water and pulp. Means are then provided for agitating the pulp which means comprise a travelling foraminous surface which is mounted eccentrically in a horizontal plane within this compartment.



Paper for Houses

A RECENT issue of the Wochenblatt fuer Papierfabrikation discusses the use of paper in the construction of houses. It is said that a house built in 1916 from paper is still standing in good condition. The material used is made in sheets, corrugated as shown in the figure, possessing a wave at right angles to the corrugations to impart lateral stiffness. The building material is made from ordinary pulp board which is impregnated with waterproofing and fireresisting materials. It is light and easy to handle.

New Use for Soda Cellulose Waste Liquors

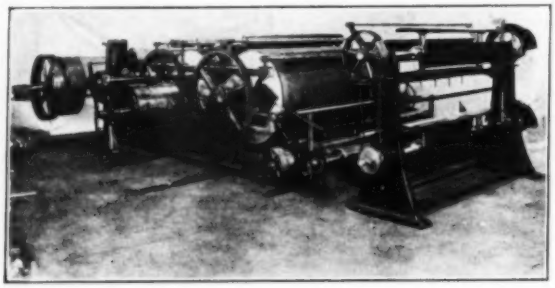
WHAT may be called a new use for the liquors that are recovered in the manufacture of soda cellulose is described in the Journal prakt. Chemie, 1914, volume 107, pages 50 to 64.

The customary raw material in the manufacture of acetone is calcium acetate which is recovered in the distillation of wood. It is proposed to use the soda cellulose waste liquors, or rather the sodium acetate, that is recovered from them as a starting point in the manufacture of acetone. The yield was first found not to be as good as that which was obtained when the calcium acetate was employed as to the raw material, but on further experimentation it was discovered that when various chemicals, such as lime, milk of lime, calcium carbonate and sodium carbonate, were employed in admixture with the acetate in the chemical process, the yield of acetone was materially increased. It was also found that much better results were obtained when the distillation of the mixture was carried out with the aid of superheated steam, larger quantities of acetone being recovered, than when inert gases, such as nitrogen or carbon dioxide, were employed.

Treating Black Liquor

THE black liquor that is recovered in the treatment of the soda pulp waste liquors contains different vegetable matter and the process which is described in French Patent No. 553,704 is concerned with a process of separating these substances from the liquor. These substances are contained in the liquor in the state of a dispersion and the liquor also contains matter in the state of a true solution and of colloidal solution. The principle of the process consists in the addition of a flocculating catalyst, preferably an organic acid.

For example one hundred liters of the black liquor are mixed with five liters of an oxalic acid solution which is satu-



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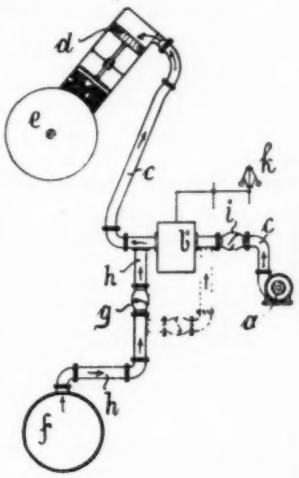
rated at a temperature of 15 degrees C. The mixture is agitated for fifteen minutes and then centrifuged. The particles of matter that are separated in this manner are treated with oxalic acid. For every three kilograms of the extracted solid, there is used one liter of saturated oxalic acid and the mixture is then agitated for half an hour. This liberates the saponified fatty bodies.

The solution is filtered and the fatty matter is extracted by means of a suitable solvent. Further treatment is given the residue in order to separate its ingredients. This consists in adding lime to it, in the proportion of 15 to 20 per cent of the weight of the material in solution, then centrifuging and filtering. The residual lime can be treated with a solvent to remove all foreign matter and calcined and used over again.

The residual liquor is then distilled to extract the principal volatile constituents, and the remaining liquor is sent to the incinerators for the recovery of the sodium carbonate or caustic soda contained in it.

Safety Appliance for Wood Grinders

IN ORDER to prevent the burning of the wood in the grinder, the water under pressure which presses the wood against the grinding surfaces is fed automatically from the pipe line to the presses of the grinder. Check valves are built in the pressure lines in order to control the flow of water under pressure to the grinder. One of these valves prevents the flow of water under pressure through the pressure line through the pump and the other valve prevents the flow of water under pressure as regulated in normal operation in the water line.



In the figure (a) is a pump which feeds water under pressure to the cylinder of the grinder which presses the wood against the grindstone (e). The pressure of the water in the line is controlled by means of the valve (b) which is regulated by means of the centrifugal pendulum (k). The water pressure controlled in this manner flows through the pipe (c) into the grinder cylinder pressing up against the piston (d).

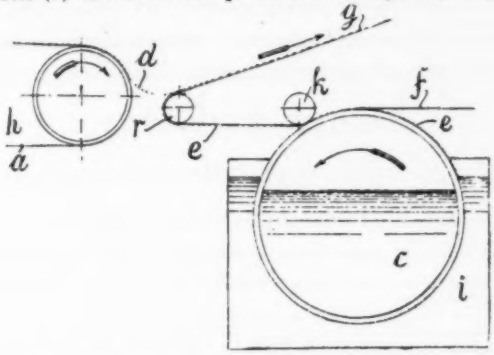
The system (f) is an independent system into which the water under pressure is carried by means of suitable series of pipe. This serves for the purpose of increasing the pressure in the pipe line (c) by allowing some of the water from this system to flow into the pipe line (c). This takes place automatically when the check valve (g) in the pipe (h) opens due to the pressure behind the valve being greater than that in front of it. This allows the water under pressure from (f) to flow into the line (c). A valve (i) which is built into the system between the pump (a) and the valve (b) prevents the flow of water from the system (f) into the pump (a).

In operating the system, care is always taken to see that the pressure in the system (f) is always somewhat smaller than the smallest pressure of the water in the line (c) found under normal operating conditions. As long as the pump (a) works in an orderly manner, the back pressure valve (i) is open and the valve (g) is closed. However, when the pump (a) is not operating properly or stops altogether, the pressure decreases in the pipe (c). As soon as the water pressure has been reduced below a certain minimum, the pressure behind the valve (g) causes it to open and then the check valve (i) is caused to close. Under these conditions the pressure exerted by the water against the piston (d) is the pressure derived from the system (f). Then when the pump starts operating again in a normal fashion, the pressure that is exerted by it on the water serves to open the valve (i) and to close the valve (g), with the result that the pressure of the water against the piston (d) is regulated by means of the valve (b). In this manner, at all times during the operation of the grinder, the pressure of the water in the cylinder is always controlled, which prevents any injury to the apparatus as well as to the wood that is being ground. The dotted line section in the figure shows another way in which the pipe (h) may be connected with the pipe (c) at a point in front of the valve (b). German Patent No. 393,672.

Marbled Paper

THE manufacture of marbled paper by a process which is shown in diagrammatic form in the accompanying sketch is patented in German Patent No. 396,101.

A cylinder wire (c), which dips in a container which holds the paper stock, is arranged on a Fourdrinier wire machine. The felt (f) of the machine passes over the cylinder as shown

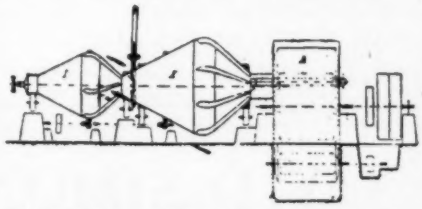


in the figure. Various stenciled designs are arranged on the cylinder. The felt touches the top of the cylinder (e), then passes over a roll (k) which is also in contact with the cylinder (c) over a small part of its circumference. Then the felt travels over a second roller (r), over which the paper web from the Fourdrinier wire (h) passes and is taken up by the felt (f).

When the cylinder wire is set in rotation, the stencils scoop up paper stock from the container (i) and form a paper web in the design of the stencils on the cylinder (c). This is indicated at (e). This web comes in contact with the felt (f) and is therewith dehydrated and is taken off the cylinder (c) by the underside of the felt (f). Then the paper web (d) which comes from the Fourdrinier wire of the paper making machine over the roller (r) is combined with the web (e) to give a single web of paper, as shown at (g).

Chemical and Mechanical Digestion of Pulp

THE apparatus which is shown in the accompanying illustration is designed for use in a process of manufacturing paper pulp by a combined chemical and mechanical digestion of the raw materials commonly used in paper manufacture.



The arrangement consists of a rotating digester (I), a mixer (II), and a disintegrating apparatus (III), which is provided with a sorting device. The mixer II acts as a sort of "flywheel" between the apparatus (I) and (III). The materials that are chemically created are stored in I and distributed in a regular fashion by these means to the apparatus (III).

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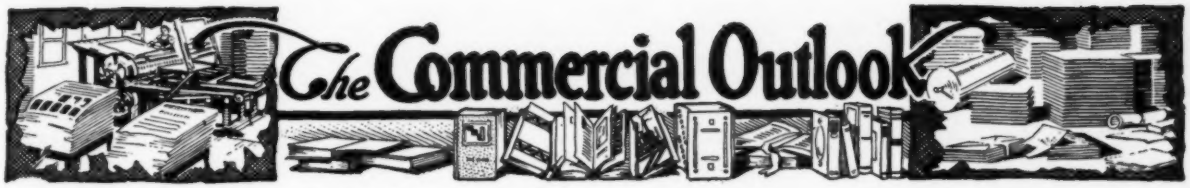

New York, August 1, 1924.

NOT in a long time, probably not in several years, has the immediate outlook for the paper industry been quite so favorable as it is today. In fact, there are prospects which only recently have developed which seem to insure a broad consuming outlet for paper of various kinds during the coming fall and winter, as well as other market conditions leading to far greater prosperity for paper manufacturers than they have experienced in a considerable period.

Everyone will admit that the substantial improvement in the farming situation in the United States is a factor that is likely to lead to excellent business in all lines. Bankers, economists and all other observers and so-called experts have for some months argued that the basic reason for poor business was that farmers were not making money; that they were marketing their products at below the cost of production. Recent sharp advances in prices of grains, cotton, and other farm products have put a distinctly different complexion on the entire situation, however. Farmers are securing attractive prices for their wheat, corn, oats and other grains in the West, and reports tell of them paying their debts, some of which are of two years' or longer standing, and of having much more money than in some years.

Obviously, this vast improvement in such a basic industry should lead to much better market conditions in all other commodities. In fact, there are already numerous indications of a quickening of business activity in various quarters. Merchants report retail trade expanding, and there has been a decided increase in wholesale buying. Everything appears to be shaping up for a very busy fall season this year. The political situation in Europe is being cleared, and there is no denying that the minute the matter of reparations is sufficiently settled to the point where business men can proceed in their operations with a fair degree of confidence, a tremendous demand for American goods is going to arise in the various European countries.

Some people, including quite a few prominent members of the paper trade, anticipate a real boom in business in the next few months. Those taking such a rosy view of the outlook base their opinions largely on expectations that there has to be a period of buying by Europe, once political and financial conditions become favorable for the reviving of industry, such as probably the European populace has never before engaged in. In other words, it is appreciated that Europe is today on the ragged edge of nowhere when it comes to raw materials, as well as the numerous manufactured articles which people in these times require and need, and that when buying starts for the replenishing of stocks permitted to become depleted since the war, the United States will obtain by far the greater part of this business, if for no other reason than that this country is today one of the few in a position to produce the goods wanted. Thus a very big increase in the export demand for all our manufactured products, together with our raw materials, is expected to be creative of a situation in business such as has not been witnessed since the never-to-be-forgotten boom period following the war.

Narrowing the prospects down to the paper industry, there seems every reason to look forward to good business in paper during the last few months of 1924. The year thus far has been none too favorable for paper manufacturers. The start was satisfactory, and quite promising, but the market condition soon changed, and in recent months papermakers have encountered most unfavorable business conditions. Demand has been very restricted, and, for that matter, continues to be, although there has been some improvement in buying in the last several weeks. Prices of paper have been on a level where paper mills have made scant profit; in fact, some doubtless have operated at a considerable loss. Our export trade in paper has been unimportant; shipments of some kinds of paper abroad have been next to negligible.

However, with the summer nearing a close and with the usual autumn pick-up in paper business commencing to stimulate trade in the commodity, with business men having little to fear from the political outlook owing to the nomination by both principal parties of men known to be conservative in their views and promising aid industry instead of harming it, and with prospects most favorable for a big buying movement not only within the confines of the United States but in various other countries of the world, activity in the paper industry is beginning to increase, mills are speeding up production somewhat because of a healthy expansion of demand, and prices of many kinds of paper are showing a stiffening tendency.

May production of paper of all kinds in the United States was on a fairly high level, according to the monthly statistical summary of the industry issued by the American Paper and Pulp Association. Total production in May amounted to 455,708 net tons of paper and board, compared with 452,211 tons in April, while shipments from mills during May totaled 444,488 tons, against 443,773 tons in the preceding month. Mill stocks of paper increased slightly in May and amounted to 243,068 tons at the end of that month, contrasted with 230,121 tons at the end of April.

In the case of news print, the outlook for increased activity is particularly bright. National elections usually witness a big gain in news print consumption, since advertisers use a large amount of space in the daily newspapers and since circulation expands during the pre-election campaigns. At the moment the news print market is firm. Talk of an additional cut in prices later in the year seems to have disappeared, and the contract basis is well maintained at 3.65 cents per pound or $73 a ton f. o. b. mills. Production of news print in the United States in June was 120,723 tons, and shipments from mills were 122,229 tons, while Canadian production was 107,667 tons and shipments 112,212 tons.

Demand for book paper is showing expansion and prices are firmer than in some time on a basis of around 6.50 cents per pound for machine finished book. The tendency in writing paper prices is strongly upward owing to the increasing cost of manufacture due to raw material advances. Moreover, there is a steady demand of fair dimensions for fine papers. Tissues are quiet and apparently in plentiful supply, this being attributed to the fact that a good many mills recently have gone over to making tissue. Wrapping paper is in limited demand but no changes of importance are noted in prices.

Box boards are in better call in some quarters. Fall activity in the paper box trade is due to start soon and demand for board should appreciably broaden. Quotations on plain chip board in the East are around $42.50 per ton f. o. b. New York, and on filled news from $45 upward.

Gypsum Company Builds Texas Plant

The United States Gypsum Co., Chicago, Ill., has operations under way at its new mill at Sweetwater, Tex., designed for the manufacture of wallboard and other gypsum products, and the first such mill of this character in this section. It is expected to develop maximum output at the new mill at an early date. It has a rated capacity of about 150,000 sq. ft. of wallboard and sheathing per day, while the plaster mill has an output of 400 tons daily, about one-fourth of which will be used for wallboard production.

A number of different kinds of plaster will be produced, including white, or rock plaster; cement plaster and wood fiber plaster. A large tract of raw material property will be developed and used in connection with the new mill. The entire project is said to represent an investment of about $1,000,000. H. D. Humphreys is works manager at the plant, while A. M. Turner, recently of the Colorado School of Mines, has been appointed chemist in charge of quality. F. J. Gaugh will be superintendent at the wallboard mill division.

The Swenson Evaporator Co. (a subsidiary of Whiting Corp.), Harvey, Ill., has opened a sales office at 316 Jackson Bldg., Buffalo, N. Y., to handle the sale of their complete line of evaporators, continuous crystallizers, pulp mill machinery, beet sugar equipment, etc. This office will be operated in conjunction with Messrs. Geo. G. Crewson and Arthur E. Smith, of the Industrial Equipment Company.

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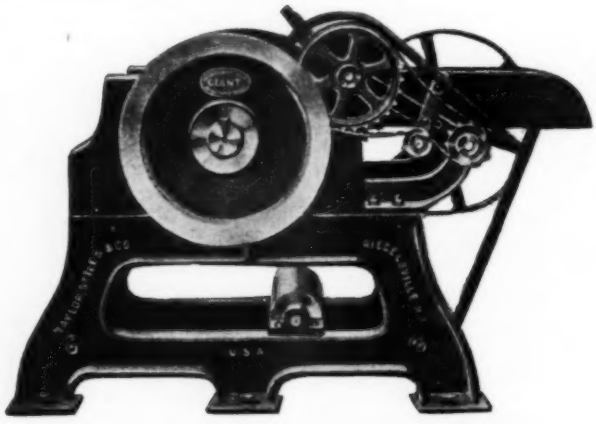

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Papermaking Rags

Papermaking rags have developed strength to the degree where it can well be said the market is in a booming condition. Some sharp advancement has been scored by prices in recent weeks, and despite the fact that values now are on levels representing a broad rise within a month's time, the trend is still upward and all indications seem to point to a further price climb. Moreover, there is every reason to believe the present strong position of rags is a healthy one. Rags are anything but plentiful; they are scarce. Some grades are scarcer than the industry probably ever before has witnessed, and there is no gainsaying that the appreciable rise in prices in recent weeks has been due in the main to the situation at the supply end rather than to any unusual buying on the part of paper manufacturers.

As pointed out in these reports heretofore, this scarcity of rags has been developing for quite some time. The consumption of papermaking rags, the low grades as used by felt paper mills particularly, possibly reached a new high point early this year when the building boom created a tremendous demand for roofing felt and other building papers. For that matter, all of this year thus far consumption of roofing rags has been heavy, but especially so early in the year and during the closing months of 1923. Roofing paper manufacturers have used not only big quantities of the grades of rags they ordinarily consume but also some of the better qualities, which has reduced the supply of rags for other paper mills. Collections throughout the United States have not been up to normal—there being two main reasons for this, one of which is that fewer collectors have been engaged in gathering waste materials because of more lucrative employment in other lines, and the second is that the general business depression caused the public to be more saving with its wearing apparel, both as to new purchases and as to discarding old garments, and thus reducing the available supply of rags.

Consequently when demand for rags from paper mills increased a month or so ago the market quickly strengthened notwithstanding that consumers came in only for a reasonably larger amount of stock. Prices began to shoot upward in spite of the careful buying of mills, because the supply of rags was not in dealers' establishments and because it was found to be an expensive undertaking to send collectors out to gather material. Lending strength to the situation was the situation abroad. It is a well known fact that American paper manufacturers obtain a large part of the rags they consume from Europe, particularly the lower qualities. All during the boom in roofing rags early this year very large amounts of rags were imported, but when the new movement in the market set in a few weeks ago it was found usual supplies in Europe were no longer available, that dealers there were well nigh cleaned out of stock and that unfavorable economic conditions in the various Continental countries were leading to a lower production of rags because of people wearing their clothes longer than ordinarily. Therefore, prices of rags in Europe advanced sharply also, and helped along the rise here.

There is still another factor in connection with the rag shortage. Clothing business in the United States has been poor in recent months. Manufacturers of all kinds of wearing apparel have been operating only at a small rate of capacity and have therefore cut up far less cloth than normally. This means that fewer cotton cuttings have been produced, and the low visible supplies of new rags at present are reflected in sharp advances in prices of these descriptions of papermaking stock also. The situation in this branch of the industry is so serious that fine paper manufacturers have made an appeal to the Government in Washington to send out propaganda urging the public to conserve rags to relieve the stringent condition with which paper mills are faced.

Prices of roofing rags have soared to where they are more than a cent per pound above the levels prevailing only a comparatively short time ago. No. 1 roofing has sold to mills at 2.40 cents per pound f. o. b. dealers' points and No. 2 packing at 2.25 cents, and probably these prices have been exceeded in some cases. Foreign dark cottons have sold at 2.40 cents ex dock New York.

New cuttings are very firm with especial strength noted in a few grades which are in exceptionally small supply. Dealers quote No. 1 white shirt cuttings at 14.50 cents per pound and higher f. o. b. shipping points, fancy shirt cuttings at 8 cents, blue overall cuttings at 10 cents, washables at 6.50 cents, light silesias at 10 cents, and unbleached muslin cuttings at 12.50 cents. Khaki cuttings have risen to 6.25 cents for O. D. khaki, corduroy cuttings are up to 5.25 cents, and light flannelettes to 10.25 cents.

Old whites are firm and extra No. 1 whites have sold at 8.50 cents per pound at shipping points. Thirds and blues are fetching 4.25 cents a pound and higher at dealers' points for repacked, and 3.25 cents for rough packing. All kinds of foreign rags show a firm price tone and are generally quoted substantially above the levels of a month ago.

Average quotations f. o. b. shipping points and ex dock New York follow:

New stock—	New York and Chicago
White shirt cuttings, No. 1	14.50-15.00
White shirt cuttings, No. 2	8.00- 8.25
Fancy shirt cuttings	7.75- 8.00
Washables, No. 1	6.25- 6.50
Unbleached muslins	12.50-12.75
White lawns	12.25-12.50
Overall cuttings, blue	10.00-10.25
Black silesias	6.00- 6.25
Light flannelettes	10.00-10.25
Canton flannels, bleached	12.00-12.50
Canton flannels, unbleached	11.50-11.75
Shoe cuttings, bleached	10.25-10.50
Shoe cuttings, unbleached	9.50- 9.75
Light silesias	10.00-10.25
O. D. khaki cuttings	6.25- 6.50
Mixed khaki cuttings	5.75- 6.00
Corduroy cuttings	5.00- 5.25
Cottonade cuttings	5.25- 5.50
Linens, No. 1 white, foreign	16.00-17.00
Light prints, foreign	6.50- 7.00
Old stock—	
Whites, No. 1, repacked	7.50- 8.50
Whites, No. 2, repacked	5.00- 5.50
Whites, house soiled	3.75- 4.00
Whites, street soiled	3.25- 3.50
Lace curtains	5.25- 5.50
Thirds and blues, rough	3.15- 3.40
Thirds and blues, repacked	4.00- 4.25
Black stockings	4.25- 4.50
Cotton canvas, No. 1	5.00- 5.50
White cotton batting	4.25- 4.50
Roofing, No. 1	2.40- 2.50
Roofing, No. 2	2.25- 2.35
Dark colored cottons, foreign	2.35- 2.50
Blue linens, foreign	5.50- 6.00
Gray linens, foreign	6.50- 7.00
White linens, foreign	11.00-12.00
Light prints, foreign	4.25- 4.50

Rope and Bagging

The old rope market has developed an easier undertone, due in part to a fairly heavy influx of this commodity into the United States from Europe, and in part to a slowing down of demand from paper mills. Prices have gradually moved off until consumers are now buying No. 1 domestic old manila rope at 5.75 cents per pound f. o. b. dealers' points. Reports say, however, that some paper manufacturers are granting a little above this figure, or in the vicinity of 6 cents, these buyers apparently not being so well fixed with supplies as others. Foreign old rope is quoted at practically the same prices as the domestic article, or between 5.75 and 6 cents a pound ex dock New York for No. 1 rope. Mixed strings have eased also to around 1.25 cents per pound at shipping points.

On the other hand, old bagging has advanced in value.

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Sales of No. 1 scrap bagging of extra good quality have been made to paper mills at 1.75 cents per pound at dealers' shipping points, while roofing bagging has brought 1.25 cents. A stronger demand for roofing and a consequent rise in prices of this grade helped to put up quotations on No. 1 bagging. Gunny is firm at 2 cents per pound for No. 1 domestic, and slightly under this price for the imported product.

F. o. b. shipping point and ex dock New York quotations as as follows:

	New York and Chicago
Gunny, No. 1 domestic	1.90-2.00
Gunny, No. 1 foreign	1.80-1.90
Scrap bagging, No. 1	1.60-1.75
Roofing bagging	1.20-1.30
Wool tares, heavy	1.80-1.90
Wool tares, light	1.65-1.75
Manila rope, No. 1, foreign	5.75-6.00
Manila rope, No. 1, domestic	5.75-6.00
Sisal strings	2.25-2.50
Mixed strings	1.20-1.35

Old Paper

Following a prolonged period of dullness bordering onto dormancy, the market for old paper is beginning to show signs of a revival. Consumers in at least certain instances are inquiring more freely for supplies and are buying in a little larger volume, and prices exhibit a stiffening trend. Many in the trade express the opinion that the usual pick up of demand that ordinarily develops in the early fall is setting in, and it is asserted that any additional improvement in buying by mills will be accompanied by a strengthening of values owing to the relatively low level of present prices. It seems a fact that dealers have greatly curtailed collections of all grades of waste paper, and it is quite likely that higher prices will be necessary to bring out supplies since it is claimed it is next to impossible for collectors to realize a profit in gathering material at prevailing market levels.

Prices of soft white shavings have firmed to where dealers in general quote 2.50 cents a pound at shipping points as a minimum for No. 1 packing, and most quotations are in excess of this figure. No. 1 hard white shavings are quoted at 3.25 to 3.50 cents per pound at dealers' points, ledger stock at 1.35 to 1.60 cents, depending on the packing; No. 1 heavy book at 1.20 to 1.35 cents, white blank news at 1.65 to 1.75 cents, and old No. 1 kraft paper at 1.75 to 1.85 cents. Folded news is bringing 55 to 60 cents a hundred pounds f. o. b. New York, while in the West slightly higher prices prevail. Similarly, No. 1 mixed paper is selling in the East at 50 cents f. o. b. New York whereas in the West dealers report sales at 65 cents at shipping points.

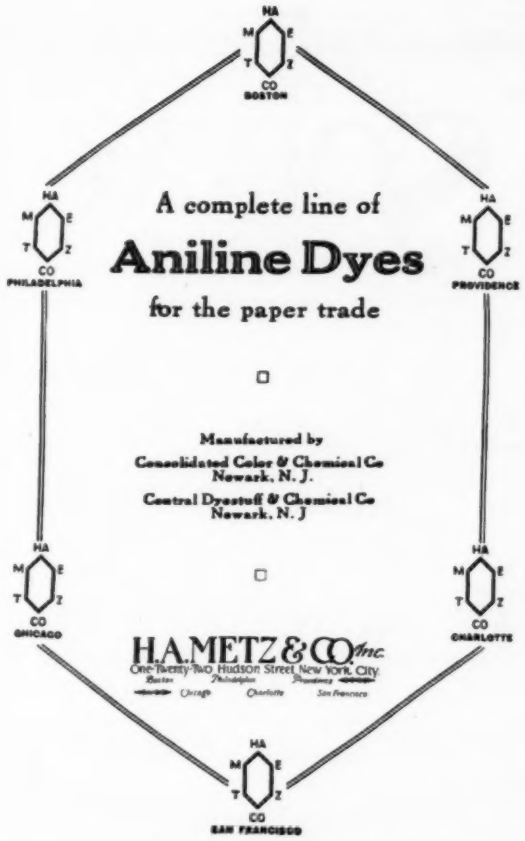
F. o. b. shipping point quotations are as follows:

	New York and Chicago
Hard white shavings, No. 1	3.25-3.50
Hard white shavings, No. 2	2.75-3.00
Soft white shavings	2.50-2.65
Colored shavings	1.25-1.40
Heavy book, No. 1	1.20-1.35
Crumpled book, No. 1	.90-1.00
Ledger stock	1.35-1.60
Kraft, No. 1	1.75-1.85
Manilas, No. 1	.85-1.00
White blank news	1.65-1.75
Over-issue news, No. 1	.80- .90
Folded news	.55- .65
Mill wrappings	.60- .70
Mixed paper, No. 1	.50- .60
Common paper	.35- .40

Chemical Pulp

The market for domestic chemical wood pulp is not showing much action. There is a fairly consistent movement of supplies against contracts but new business is slow in developing, and manufacturers in a great many cases are operating their plants on curtailed schedule. There is no question that the heavy arrivals of pulp from Scandinavia in recent weeks on first open water shipment orders have had a good deal to do with the narrow call for domestic fibre. Consumers have been well provided with pulp for a while and have not been in much of a mood to augment their supplies, presumably waiting until they have used up some of the stock on hand before seeking to purchase additional pulp.

At the same time the market undertone appears moderately firm. Producers are not pressing sales at ruling prices, doubtless because there is very little profit in pulp manufacture at prevailing market values, with sellers probably realizing that if they should seek to push buyers the result would be only to lower the market against themselves. Bleached



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sulphite is quoted at 3.75 to 4.25 cents per pound at pulp mills for No. 1 bleached, with some No. 2 grades available at 3.50 cents and possibly less. No. 1 unbleached sulphite is selling at around 2.65 cents a pound at producing plants, easy bleaching sulphite at 2.75 cents upward, and No. 1 kraft at 2.75 to 3 cents per pound. Mitscherlich unbleached sulphite is quoted at 3.25 to 3.50 cents at pulp mills and one manufacturer producing an extra grade of this pulp is reported asking 3.75 cents.

F. o. b. pulp mill quotations ase as follows:

Bleached sulphite	3.75-4.25
Easy bleaching sulphite	2.75-3.00
Unbleached sulphite, No. 1	2.50-3.00
News grade sulphite	2.40-2.65
Soda pulp, bleached	3.50-3.75
Mitscherlich, unbleached	3.25-3.75
Kraft, No. 1	2.75-3.00
Screenings, refined	1.50-1.75

Mechanical Pulp

It is the customary thing as the summer wears on and the water in pulp mill streams falls for mechanical pulp to develop a firmer price tone. That is exactly what is happening at present. Ground wood is decidedly stronger in price, and despite the fact that latest issued production statistics show that grinders have comparatively large stocks of pulp on hand, there is little or no selling pressure to be observed; in fact, manufacturers are quite firm in their attitude and are holding for the full prices quoted in almost every instance. Surplus stocks are being held in reserve against fall deliveries, and in quite a few cases grinding operations are tapering off because of low water, which means that production is decreasing and is likely to continue on the downgrade if the usual drouth arises this year.

Domestic producers are quoting in the vicinity of $30 a ton f. o. b. pulp mills for prime spruce ground wood for prompt shipment. Perhaps some supply can be bought at slightly under this price basis but most domestic manufacturers are conserving their pulp for their own use and are not offering much in the open market. Canadian grinders are quoting about $30 at grinding plants, and in some cases higher, depending on the air dry test and the freight to consuming points. Scandinavian ground wood is quoted in New York at between $32 and $35 a ton ex dock at that port.

Chemicals

Practically all the chemicals consumed by paper and pulp manufacturers are in slow demand. Most consumers are getting along with contract supplies in such a manner as to preclude the necessity of additional buying at this time, and the market dullness has led to some recession in quoted prices. Casein displays a rather easy tendency and is quoted around 10 cents per pound. Bleaching powder holds unchanged at 1.90 cents a pound at works. Soda ash is quoted on a flat basis of 1.38 cents per pound at works, and caustic soda at 3.10 to 3.20 cents. China clay tends to slide in price, as does rosin and brimstone.

Average quotations are as follows:

Alum, lump ammonia	3.25- 3.50
Alum, lump starch	3.75- 4.00
Blanc, fixe, powdered	3.75- 4.00
Bleaching powder	1.90- 2.00
Brimstone (long ton, at mine)	18.00-20.00
Casein (duty paid)	10.00-11.00
Caustic soda, spot delivery	3.10- 3.20
China clay, domestic washed	12.00-15.00
China clay, foreign	15.00-20.00
Rosin, grade E	5.75
Satin white	2.00- 2.25
Soda ash, 58 per cent light (bags)	1.38
Starch, papermakers', in bags	3.40- 3.70
Talc (ton)	16.00-17.00

The Armstrong Machine Works, Three Rivers, Michigan, announces the acquisition of Mr. Otto J. Goeppinger, an engineer who has been closely associated with the paper industry for several years and who is qualified by experience and engineering training to make authorative recommendations covering the efficient drainage of paper machine dryers. Mr. Goeppinger's services are offered for the solution of problems involving the use of steam traps in processes of making paper. Unquestionably the services of a specialist in this field will be welcomed by many mills, as it is widely recognized that paper machines offer the most perplexing of drainage problems.

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Conveyor or Gravity Feed Shredder

THE operation of a beater, with its wear and tear and tremendous power consumption, has one primary purpose, namely, hydration. Anything that will economically bring about hydration more quickly relieves the beater just that much, cuts down on operating costs and speeds the process of paper making.

The Mitts & Merrill Shredder performs on magazines, books, old paper and boxboard, frozen or dried pulp laps, roll and sheet stock, in such a way as to greatly reduce their resistance to hydration when they reach the beater. It gives the beater an economical lift.

Our Shredders are built in sizes with spouts ranging from 18″ to 45″ wide. We will be glad to quote you on any size adapted to your requirements.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse.

MITTS & MERRILL

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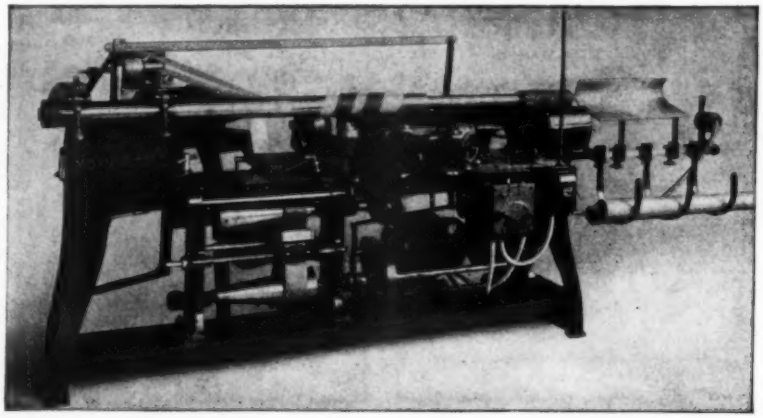

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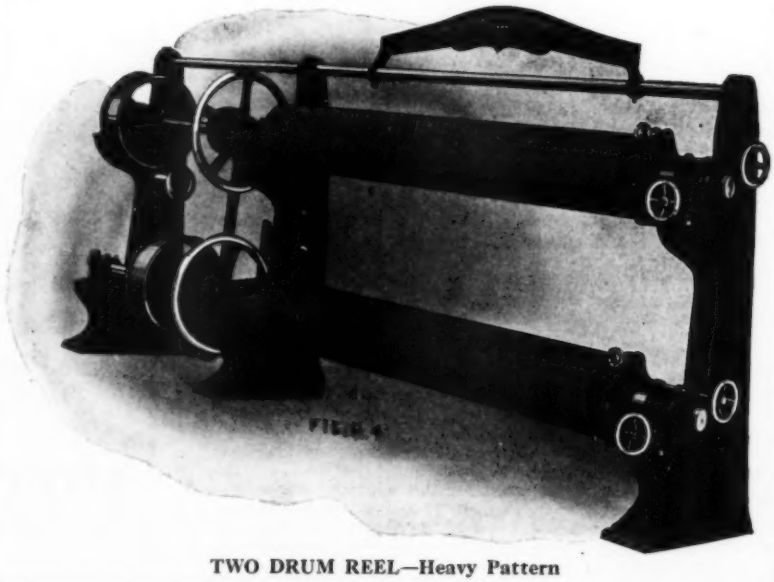

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New Papers

Writing—	
White rag	20-45
White sulphite	11-30
Colored rag	16-40
Ledger—	
White rag	20-50
White sulphite	13-30
Colored sulphite	40-30
Colored rag	16-50
Bonds—	
White rag	19-45
White sulphite	9-30
Colored sulphite	10-30
Colored rag	18-45
Book—	
No. 1 S. & S. C.	6.50- 7.25
Machine finished	6.25- 7.00
English finished	6.50- 7.25
Coated and enameled	8.00-14.00
Lithographed, M. F.	9.00-15.00
Newsprint—	
Rolls, contract	3.65
Rolls, transient	3.85- 4.25
Sheets	4.25- 4.50
Side runs	3.25- 3.75
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.75- .85
No. 2 white, 24-36	.70- .75
No. 1 manila, 24-36	.70- .75
Kraft	1.00- 1.25
Wrapping—	
No. 1 Kraft	6.00- 6.75
No. 2 Kraft	5.25- 5.75
Boards—	New York and Chicago
Solid news	50.00-55.00
Straw	52.50-57.50
Plain chip	42.50-47.50
White coated chip	60.00-65.00
Manila coated chip	55.00-60.00
Binder's board	70.00-75.00

Another Source of Supply for the Production of Paper

The Canadian Pacific Railway Company is ever on the alert to interest the British business man in the wonderful possibilities which exist for his capital and enterprise in this large and flourishing Dominion, and among the great expanding industries which are particularly mentioned as yearly increasing in number and volume of production is the pulp and paper industry.

One of the, as yet, unexploited industries of Canada to which the Department of Colonization and Development draw attention is the manufacture of paper pulp from flax straw, which problem has been investigated and experimented upon by the Canadian Pacific Railway Company.

Apparently the threatened shortage of raw material for paper production in the not far distant future is an ill wind which blows at least one section of the community some good. The possibilities of the development of this industry are of direct interest to the Western farmer, because he is annually wasting about one million tons of raw material from which it has been proved that a paper pulp can be made convertible into a high grade paper comparing well with the linen rag product. for which price and demand are today higher than ever before.

The material referred to is flax (linseed) straw, at the present time burned and wasted wherever flax is grown for linseed, the straw crop representing, therefore, a dead loss to the farmer. Practically all this flax is grown for linseed, and is entirely different from the flax grown for fiber. This linseed flax is cut at a later stage of its growth and threshed for seed. The resulting straw is too short, broken and brittle for use in the textile trades, and has hitherto been piled alongside the thresher and burned.

A use for this wasted flax straw has now been demonstrated in the manufacture of pulp (bleached and unbleached half stuff) for conversion into high grade papers. It only needs the coöperation of the farmer in collecting and delivering the straw, and the necessary capital to start a new industry will at once add to the prospects of the flax growing and pulp and paper industry of Canada.

It has been said that paper can be made from anything provided the material supplied can be economically produced and manufactured. It looks very much as if this by-product of linseed production meets with all the necessary qualifications. In any case, as far as an economical supply is concerned there is no doubt of the available resources of the basic raw material—straw. To judge by the production figures, a good year's crop of flax should enable Canada to turn out almost half as much pulp from this source as she already exports to the U. S. A.

As far as economic production is concerned, the difficulty is met by the establishment of portable power mills, where shive is stripped from the straw and pressed into baled tow. A tow mill would be the center of collection of straw for a radius of about ten miles. After threshing and freeze-up, the farmers would haul straw to the tow mills. This they should be able to do at a reasonable price per ton, as they would secure a market for what would otherwise be wasted, and employment for horses, help, and equipment, which otherwise must be maintained in idleness or only partially employed. The establishment of these tow mills will also tend to stabilize labor and encourage increased flax production.

The experimental stage in the manufacture of paper pulp from flax straw has actually been passed, as some quantities of unbleached flax straw pulp have already been manufactured and turned into paper.

The bleached product is of so high a grade that it is second only to linen and best cotton paper making material, and from it good-colored strong writing and high grade papers can, and have been, manufactured, whilst unbleached pulp has a wide range of utility for the making of some writing papers, rope-paper, flour and cement bags, straw-board, etc. It has been conservatively estimated that the total cost of manufacture of the bleached pulp will be from $170 to $200 per ton, and paper material comparable with it is today selling at $300 per ton.

Further experiments with a view to extending the uses of this new type of paper are now being carried out by the De Vains process in Paris.

Colored Drawings Aid Identification of Paper Fibers

A set of colored plates has been prepared by the Bureau of Standards of the Department of Commerce illustrating eight paper fiber compositions as seen under the microscope. They are intended to serve as reference standards for use in the identification of paper fibers and in the estimation of the fiber composition of the paper.

The fibers covered by the set are rag (cotton and linen), sulphite (coniferous), soda (deciduous), groundwood (coniferous), sulphate (deciduous), jute, manila, and esparto. Special stains were used to bring out the fiber markings. The fibers were drawn with the aid of a camera lucida and the drawings were painted with water colors, being matched by daylight with the actual fibers as seen under a microscope.

These drawings are expected to prove of great value to laboratory workers in the microanalysis of paper, as the colored micrographs come much closer than photomicrographs do to representing the fibers as they actually look when seen through the microscope. They show not only the form but the color reactions as well.

These plates are published in Technologic Paper No. 250 of the Bureau of Standards, entitled "Pulp and Paper Fiber Composition Standards." Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 15c cash.

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EXPORTS

Paper exports from the United States during May, 1924, valued at $2,076,353, registered a decrease of three per cent compared with the preceding month and eight per cent compared with May, 1924, according to statistics compiled and issued by the Department of Commerce. Declines in the volume exported compared with last year were noticeable in shipments of newsprint, uncoated book paper, cover paper, greaseproof paper, writing, surface-coated, tissue and crepe papers, boards, photographic and hanging papers, bags, boxes and cartons, and papeteries, and the majority of these also showed a falling off in the volume of shipments compared with April, 1924.

On the other hand, exports of wrapping paper, including kraft; toilet paper, paper towels and napkins, sheathing and building papers, wall board, cigarette and carbon papers, envelopes and cash register and adding machine papers increased in May as compared with the same month a year ago, and in the case of wrapping papers, toilet paper, sheathing and building papers and envelopes as compared with April this year.

Exports of the leading paper and board items during May, 1924; April, 1924, and May, 1923, are shown in the following table:

	——May, 1923——		——April, 1924——		——May, 1924——	
	Pounds	Value	Pounds	Value	Pounds	Value
Newsprint	2,990,010	$157,723	3,183,618	$157,186	2,842,210	$140,293
Book paper, not coated	2,367,191	264,826	1,257,377	143,925	1,356,764	162,315
Wrapping paper (not including kraft)	1,683,761	155,832	2,148,033	168,138	2,251,539	161,260
Paperboard and strawboard	5,688,317	281,253	6,274,207	274,834	5,513,150	225,352
Photographic paper	175,752	197,177	149,116	162,248	164,503	177,087
Paper bags	873,524	73,700	1,197,479	106,495	866,812	81,635
Paper boxes and cartons	1,147,792	101,866	1,497,473	112,284	920,935	91,598
Other paper and products	.....	1,084,633	.....	981,204	.....	1,036,873
Total	.....	$2,317,010	.....	$2,139,764	.....	$2,076,353

IMPORTS

Wood Pulp

The market for imported wood pulp is showing a decided tendency to stiffen. In fact, demand within the last few days has improved somewhat and prices on some kinds of pulp have not only firmed in tone but have scored a slight advance. The situation at primary sources abroad seems to be strengthening to a degree where prices are being automatically moved up to at least a little higher level, while importers in general are confident in their views that bigger business and firmer prices lie ahead.

It would appear as if the stiffening of quotations has been due in part to an increase in demand from trade quarters. Paper manufacturers in some cases have bought with more freedom but a good part of the demand has come from dealers and importers who anticipate higher prices in the not distant future and who apparently are buying up pulp for the expected advance. It is generally conceded that if paper business develops in the volume there are favorable prospects of and consumers are obliged to come into the market for larger amounts of foreign pulp, prices will undoubtedly rise because the statistical position of wood pulp in the Scandinavian countries is quite strong, manufacturers there having disposed of the bulk of their production for this year and encountering a growing demand from European consumers. In the case of kraft, as an example, it is stated on good authority that Swedish producers have only something like 20,000 tons more of this kind of pulp to sell for the balance of this year, while mills in Sweden also are said to be well sold ahead on sulphite.

Imports of pulp into the United States have been fairly heavy in recent weeks. First open water shipments from Sweden are still coming in, owing to the long delay in getting shipments off from primary sources this year. The fact that arrivals from abroad have been large has of course enabled many papermakers to remain out of the market except as limited buyers, yet there has been a noticeable increase in buying interest in the last few days, indicating possibly that consumers appreciate the strengthening condition of the market and that they are looking ahead somewhat regarding supplies.

Pulp imports into the U. S. in May showed a substantial jump over April and also a gain over the May, 1923, receipts. Total imports of chemical pulp in May last were 73,969 net tons, valued at $4,453,093, according to Department of Commerce statistics, compared with imports of 56,256 tons in the preceding month of a value of $3,532,029, and 65,137 tons of a value of $4,775,791 in May last year. May arrivals brought the total importations for the first five months of 1924 up to 397,656 net tons, showing an average of 79,531 tons monthly, contrasted with imports averaging 86,477 tons per month in the same period last year.

Imports of ground wood in May last amounted to 11,867 tons, compared with 15,793 tons imported in the same month of 1923, making a total for the first five months of 1924 of 79,974 tons or a monthly average of 15,995 tons, against an average of 23,671 tons per month in the corresponding time a year ago.

The manufacturers' association minimum price of 2.60 cents per pound ex dock New York on Swedish kraft pulp of prime quality is firmly maintained and this represents about the bottom price at which Swedish kraft is available while special brands are selling at 2.80 cents and even higher in exceptional instances. Foreign bleached sulphite is firmer in price. About the lowest basis quoted on No. 1 bleached sulphite is 3.65 cents ex dock New York, and most importers quote around 3.75 cents and up to 4.25 cents for extra quality pulp. Strong unbleached sulphite is selling around 2.65 to 2.70 cents a pound on the dock, and Mitscherlich unbleached at from 2.60 to 3.25 cents, depending on the grade. Ground wood is quotably firm at $33 to $35 a ton ex dock New York.

Receipts at the port of New York in July and current market quotations ex dock New York are:

Bleached sulphite, No. 1	$ 3.65- 4.25
Unbleached sulphite, No. 1	2.50- 3.00
Easy bleaching	3.00- 3.25
Mitscherlich unbleached	2.60- 3.25
Kraft	2.60- 2.90
Ground wood, per ton	33.00-35.00

Scandinavian Pulp Agency, 254 bls. from Gothenburg, 2,650 from Skutskar, 1,500 from Bremen and 127 from Copenhagen; Johaneson, Wales & Sparre, 250 bls. from Gothenburg. 375 from Copenhagen and 1,350 from Bremen; Industrial Fiber Corp., 2,400 bls. from Gothenburg; E. M. Sergeant Co., 1,718 bls. from Gothenburg, 285 from Christiania, 150 from Copenhagen and 500 from Greaker; H. Hollesen, Inc., 4,113 bls. from Bremen and 1,300 from Hamburg; Bulkley, Dunton & Co., 5,780 bls. from Bremen, 5,250 from Gefle, 5,000 from Christiania and 7,750 from Hudikvalls; Pagel, Horton & Co., 21,376 bls. from Gefle; Poland Paper Co., 2,750 bls. from Christiania; J. Andersen & Co., 2,340 bls. from Christiania, 1,200 from Hudikvalls, 150 from Hamburg and 1,250 from Bremen; Borregaard Co., 542 bls. from Christiania; Atterbury & McKelvey, 300 bls. from Christiania; Hartig Pulp Co., 500 bls. from Hamburg and 2,625 from Gefle; Lagerloef Trading Co., 1,611 bls. from Kotka and 750 from Borga; Chase National Bank, 156 bls. from Helsingfors; Castle & Overton, 267 bls. from Rotterdam and 2,020 from Bremen; Tidewater Paper Mills Co., 7,552 bls. from Madelaine River, N. S.; Equitable Trust Co., 1,250 bls. from Bremen; Price & Pierce, 240 bls. from Gothenburg; New York Trust Co., 830 bls. from Greaker and 300 from Hamburg; National City Bank, 500 bls. from Greaker; J. L. Bache & Co., 525 bls. from Hamburg; M. Gottesman & Co., 4,000 bls. from Salonica; J. Lyon & Co., 125 bls. from Bremen; Order, 650 bls. from Gothenburg, 3,163 from Kotka, 125 from Hallstavik, 6,555 from Swanson Bay, 1,250 from Gefle, 2,875

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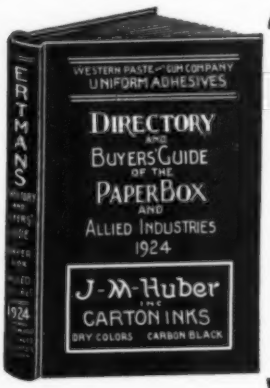

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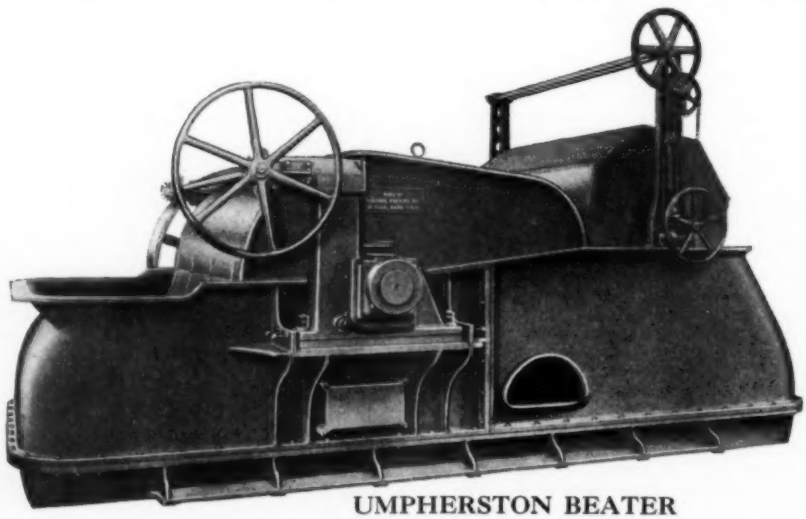

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from Borga, 1,519 from Helsingfors, 1,500 from Bremen, 138 from Rotterdam and 1,361 from Trangsund.

Paper Stock

The feature in imports of papermaking material other than wood pulp into the United States in July, judging from receipts through the port of New York, was the increased arrivals of rag stock, reflecting the broader market for this commodity among paper mills. Some big shipments of rags reached New York and it seems safe to state that imports for the month were by far larger than in the several previous months. Old rope arrivals held up to a fairly high level, and there were at least normal amounts of bagging and other materials received from foreign sources. Imports of papermaking stock of all kinds at the port of New York in July, with names of consignees, were as follows:

Old Rope

Brown Bros. & Co., 510 bls. and 376 coils from Rotterdam, 219 coils from Hamburg, 596 coils from Hull, 53 coils from Bremen, 727 coils from Bristol, 176 coils and 70 bls. from Antwerp, 44 bls. from London and 449 coils from Newcastle; E. J. Keller Co., 54 bls. from Rotterdam, 452 bls. and 221 coils from Copenhagen and 40 bls. from Trieste; Ellerman's Wilson Line, 187 coils from London; W. Schall & Co., 36 coils from Hamburg and 36 bls. from Barcelona; Anglo-South American Trust Co., 1,359 coils from Genoa; G. M. Graves Co., 60 bls. from Rotterdam; Cohen & Co., 4 coils from Nassau; United Fiber Co., 65 coils from Glasgow; U. S. Mortgage & Trust Co., 19 bls. from Rotterdam and 31 coils and 10 bls. from Bremen; Order, 194 coils from Marseilles, 135 coils from Rotterdam, 53 bls. from Naples and 40 coils from London.

Old Bagging

National City Bank, 130 bls. from Antwerp; E. Butterworth & Co., 132 bls. from Rotterdam; E. J. Keller Co., 155 bls. from Antwerp, 128 from Barcelona and 70 from Rotterdam; Salomon Bros. & Co., 105 bls. from Hamburg; Felix Salomon & Co., 71 bls. from Hamburg; Daniel M. Hicks, Inc., 9 bls. from Havre and 77 from Rotterdam; Equitable Trust Co., 30 bls. from Havre; Castle & Overton, 184 bls. from Havre; Mechanics & Metals National Bank, 73 bls. from Havre; S. Birkenstein & Sons, 88 bls. from Rotterdam and 105 from Antwerp; Brown Bros. & Co., 147 bls. from Rotterdam; International Acceptance Bank, 76 bls. from Hamburg; Bank of London and South America, 165 bls. from London; Order, 62 bls. from Antwerp, 92 from Glasgow and 142 from Bremen.

Rags

E. J. Keller Co., 550 bls. from Kobe, 551 from Antwerp, 84 from St. Nazaire, 149 from Leghorn, 946 from Copenhagen, 725 from Bremen, 2,079 from Rotterdam, 210 from Algiers, 2,650 from Hamburg, 61 from Trieste, 37 from Marseilles, 152 from Naples, 242 from Amsterdam and 110 from Barcelona; Wilkinson Bros. & Co., 141 bls. from London and 96 from Rotterdam; Paul Berlowitz, 291 bls. from Rotterdam and 338 from Antwerp; Albion Trading Co., 242 bls. from Dunkirk and 4 from Bremen; Stone Bros. & Victor Galaup Co., 659 bls. from Havre, 146 from Genoa and 16 from Hamburg; M. Wolfer & Co., 41 bls. from Havana; Salomon Bros. & Co., 133 bls. from Hamburg and 7 from Dunkirk; Castle & Overton, 160 bls. from Rotterdam, 60 from Hamburg and 24 from Hull; Whaling Waste Products Company, 127 bls. from Rotterdam; Katzenstein & Keene, 116 bls. from London; S. Birkenstein & Sons, 108 bls. from Antwerp, 74 from Glasgow, 356 from Bristol and 859 from Rottredam; Felix Salomon & Co., 149 bls. from Hamburg; Darmstadt, Scott & Courtney, 56 bls. from Hamburg; Robert Blank, 60 bls. from Bremen; A. H. Searle, 97 bls. from Naples; F. Labomonz, 55 bls. from Hamburg; Maurice O'Meara Co., 76 bls. from Antwerp and 211 from Buenos Aires; G. M. Graves Co., 63 bls. from Rotterdam; J. J. Patricof, 72 bls. from Rotterdam; Daniel I. Murphy, Inc., 210 bls. from Rotterdam; Daniel M. Hicks, Inc., 148 bls. from Rotterdam; L. H. Abenheimer, 40 bls. from Hamburg; E. Butterworth & Co., 34 bls. from Marseilles; National City Bank, 230 bls. from Antwerp, 412 from Bremen, 48 from Hamburg and 276 from Copenhagen; Anglo-South American Trust Co., 219 bls. from Rotterdam; Union National Bank, 525 bls. from Hamburg and 85 from Genoa; Guaranty Trust Co., 149 bls. from Leghorn, 506 from London, 67 from Glasgow, 152 from Naples, 299 from Hamburg, 28 from Havre, 160 from Bremen and 669 from Copenhagen; Mechanics & Metals National Bank, 105 bls. from Rotterdam, 40 from

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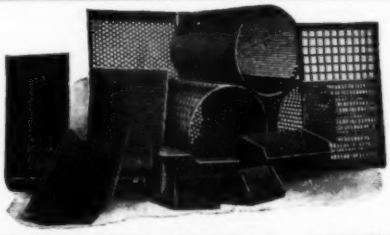

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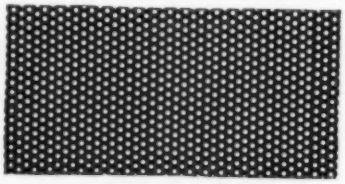
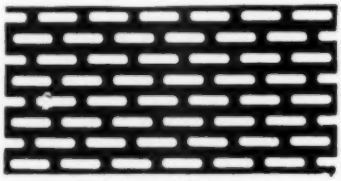
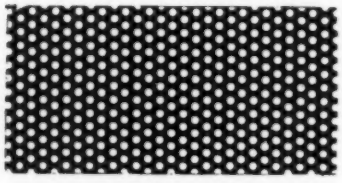


.065 inch round



⅛ x ½" Slots



3/32 inch round

Steel, Copper, Brass, Bronze and other alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.

CHARLES MUNDT & SONS **57-65 Fairmount Avenue, Jersey City, N. J.**

LOCKPORT, N. Y. **NIAGARA FALLS, ONT.**

F. W. ROBERTS MANUFACTURING CO.

All Products Guaranteed to Suit You

STEEL SHELL BURRS YELLOW JACKET SHOWER

Read the "ROBERTS IDEA"

Bordeaux and 216 from Havre; Manufacturers Trust Co., 4 bls. from Rotterdam; Banque Belge, 45 bls. from London and 48 from Liverpool; Equitable Trust Co., 118 bls. from Marseilles and 129 from Havre; Coal & Iron National Bank, 149 bls. from Rotterdam and 120 from Antwerp; International Acceptance Bank, 400 bls. from London, 349 from Bristol, 583 from Hamburg, 13 from Rotterdam and 73 from Bremen; Bank of New York & Trust Co., 399 bls. from Copenhagen; Chase National Bank, 28 bls. from Antwerp; Strupp & Co., 123 bls. from Bremen; American Merchant Lines, 61 bls. from Rotterdam; Kidder-Peabody Acceptance Corp., 93 bls. from Havre; A. W. Fenton, Inc., 711 bls. from Rotterdam, 152 from Bremen and 27 from Hamburg; Robert Bishop Mfg. Co., 203 bls. from Dunkirk; A. Darden, 52 bls. from Havana; Goldman, Sachs & Co., 544 bls. from Bremen, 150 from St. Nazaire and 127 from Hamburg; American Express Co., 39 bls. from Glasgow; McKenzie & Co., 18 bls. from Havre; Baring Bros. & Co., 12 bls. from Havre; Order, 118 bls. from Genoa, 95 from Liverpool, 656 from Hamburg, 415 from Antwerp, 144 from Rotterdam, 141 from Glasgow and 43 from Bremen.

Miscellaneous Paper Stack

S. Birkenstein & Sons, 195 bls. from Glasgow; A. H. Searle, 5 bls. from Glasgow; Mechanics & Metals National Bank, 21 bls. from London; Daniel M. Hicks, Inc., 25 bls. from Dunkirk; Brown Bros. & Co., 102 bls. from Bristol and 66 from Glasgow; E. J. Keller Co., 418 bls. from Antwerp and 261 from Copenhagen; Equitable Trust Co., 210 bls. from Antwerp; National City Bank, 24 bls. from Bremen and 71 from Hamburg; Amsinck, Sonne & Co., 238 bls. from Glasgow and 45 from Havre; Anglo-South American Trust Co., 218 bls. from Glasgow; National Bank of New York, 66 bls. from Hamburg; American Exchange National Bank, 29 bls. from Antwerp; Bank of New York & Trust Co., 116 bls. from Barcelona; W. Schall & Co., 74 bls. from Barcelona; British Bank of South America, 72 bls. from Liverpool; Order, 160 bls. from London, 45 from Havre, 126 from Dundee, 65 from Liverpool, 47 from Barcelona and 68 from Hamburg.

Paper

Imports of paper into the United States were about normal during July, judging from receipts through the port of New York. There was no outstanding feature of importations. Arrivals of news print were of fair volume, as were those of wrapping paper. Some sizeable shipments of cigarette paper were received, and usual amounts of hanging, filter, drawing and other papers were noted in the manifests. Importations of paper of all kinds through the port of New York in July follow:

Printing

Perry, Ryer & Co., 36 cs.; Herrmann Paper Co., 19 cs.; Drinkhansen & Hollkott Paper Co., 444 rolls; B. F. Drakenfeld & Co., 122 cs.; J. P. Heffernan Paper Co., 392 rolls; Maurice O'Meara Co., 55 bls.; Falsing Paper Co., 40 cs.; Chemical National Bank, 2,880 rolls; Hudson Trading Co., 168 rolls; Traders Paper Co., 987 rolls; International Acceptance Bank, 1,278 rolls; American Exchange National Bank, 142 rolls; Parsons & Whittemore, 2,782 rolls; Canfield Paper Co., 48 bls.; Hormann, Schutte & Co., 29 cs.; Keuffel & Esser Co., 49 rolls and 12 cs.; W. Hartmann & Co., 274 rolls; Fourth & First National Bank of Nashville, 500 rolls; C. Steiner, 27 bls. and 31 cs.; H. Reeve Angel & Co., 130 rolls; Daily News, 72 rolls; Street & Smith Publishing Co., 168 rolls; F. C. Strype, 17 cs.; Oxford University Press, 8 cs.; Wilkinson Bros. & Co., 19 bls.; M. Gottesman & Co., 437 rolls; American Express Co., 28 rolls; Equitable Trust Co., 1,329 rolls; P. Puttmann, 11 cs.; Seaman Paper Co., 139 rolls; P. C. Zuhlke, 80 cs.; order, 4,865 rolls and 86 cs.

Wrapping

D. S. Walton & Co., 1,420 rolls and 36 bls.; Irving Bank-Columbia Trust Co., 105 rolls and 68 bls.; Chatham & Phenix National Bank, 308 rolls; J. P. Heffernan Paper Co., 2,889 bls.; Corn Exchange Bank, 1,872 rolls and 6 bls.; National City Bank, 2,019 rolls and 80 bls.; W. Hartmann & Co., 7 rolls and 41 bls.; F. C. Strype, 431 bls. and 14 cs.; Great Eastern Paper Co., 400 bls.; Manhattan Paper Co., 497 rolls; Schenkers, Inc., 20 cs.; Alling & Cory Paper Co., 241 bls.; C. Steiner, 48 bls.; Blauvelt-Wiley Paper Mfg. Co., 126 bls.; Stewart Hartshorn & Co., 88 cs.; E. Dietzgen & Co., 183 rolls; Hudson Trading Co., 144 rolls; Pulp and Paper Trading Co., 3 cs.; W. Van Doorn, 38 rolls and 22 bls.; Republic Bag & Paper Co., 3,822 rolls and 596 bls.; Steffens, Jones & Co., 48 cs.; W. Schall & Co., 32 cs.; Chemical National Bank, 32 rolls;

COPYRIGHTED

Cut down *excessive* wrapping paper investment. Why carry two wrapping paper lines for one wrapping paper *purpose?*

MOSINEE

presents a perfect wrapping paper, weight and strength for each wrapping purpose. Made in all weights from 15 pounds to 100 pounds basis. The one complete, standardized and economical line of wrapping paper sold.

Mosinee Kraft

"The Wrapper that Delivers the Goods"

Paper and Pulp Knife Grinders
using
Sectional Wheel, Cup Wheel or Straight Wheel
Catalog on Request
BRIDGEPORT SAFETY EMERY WHEEL COMPANY
102 Knowlton Street, Bridgeport, Conn.

Robins Conveying Systems
FOR HANDLING BULK MATERIALS
Write for Handbook of Conveyor Practice
ROBINS CONVEYING BELT COMPANY
New York Chicago Pittsburgh Boston

PRESSURE PIPE THAT NEVER BURSTS
Built in sizes 1 inch to 48 inches

WYCKOFF WOOD PIPE
The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for Paper Stock and Acids that can be obtained.
Write today for catalog and prices
A. WYCKOFF & SON COMPANY
1855 Elmira, N. Y., U. S. A. 1924

MANITOWOC ENGINEERING WORKS
MANITOWOC, WISCONSIN

Designers and Builders of

Digesters
Paulson Barking Drums
Experimental Digesters
Autoclaves
Wash Tanks
Diffusers
Disc Evaporators
Incinerators
Blow Pipes
Causticizing Tanks
Howard Refiners
Storage Tanks
Cylindrical Rotaries and Globe Rotaries
Bleach Mixers
Clay Mixers

"MICHIGAN" Combination Steel and Wood Pipe

LONG DISTANCE CONVEYOR OF WATER AND PAPER STOCK IN PAPER AND PULP MILLS—Specially Adapted to Carry Sulphite, Ground Wood and "White Water"

Eighteen reasons why you should use "Michigan" combination steel and wood pipe
1—Durability of Wood Shell. 2—Sanitary. 3—20% more capacity than Cast Iron Pipe. 4—Simplicity in handling. 5—Light in weight. 6—Speed in laying. 7—Protects against freezing. 8—Not affected by Electrolysis. 9—Rigid inspection of materials. 10—Efficient construction of stave. 11—Strength of steel banding. 12—Protection of banding with asphalt coating. 13—Cannot burst under pressure. 14—Can be laid in a wet trench. 15—Short curves without specials. 16—Low installation and maintenance cost. 17—Responsibility of company. 18—Not affected by sulphur or chemical solutions.

THE MICHIGAN PIPE COMPANY
Dept. 17 BAY CITY, MICHIGAN

New York City, N. Y.....17 East 42nd St.
Oklahoma City, Okla.....105 West 16th St.
Chicago, Ill.....Leiter Bldg., 15 East Van Buren St.
Boston, Mass.....Room 737, Oliver Bldg.
Cleveland, Ohio.....919 Ulmer Bldg.
Chattanooga, Tenn.....702 James Bldg.
Philadelphia, Pa.....318 Widener Bldg.
Pittsburgh, Pa.....323 Fulton Bldg.

"Steel for Strength—Wood for Durability"

International Acceptance Bank, 101 bls. and 52 rolls; Wilkinson Bros. & Co., 250 bls. and 26 rolls; Bowater Paper Co., 48 rolls and 14 bls.; order, 7,257 rolls, 2,193 bls. and 12 cs.

Cigarette

P. J. Schweitzer, 207 cs.; Standard Products Corp., 287 cs.; F. P. Gaskell & Co., 120 cs.; Southern Pacific Co., 3 cs.; DeManduit Paper Corp., 270 cs.; R. J. Reynolds Tobacco Co., 1,180 cs.; American Tobacco Co., 400 cs.; Zorro Tobacco Co., 48 cs.; Surbrug Co., 15 cs.; Steiger Trading Co., 3 cs.

Writing

Coenca-Morrison Co., 5 cs.; C. A. Redden, 2 cs.; American Templex Co., 12 cs.; Japan Paper Co., 4 cs.; Steffens, Jones & Co., 8 cs.; Guibont Freres & Co., 41 cs.; American Express Co., 2 cs.; F. C. Strype, 5 cs.; J. C. Robold & Co., 37 cs.; Intercontinentale Co., 76 cs.; A. Goodman & Co., 5 cs.; J. W. Hampton Jr. & Co., 21 cs.; G. Contchegulian, 12 cs.; order, 16 cs.

Drawing

E. Dietzgen & Co., 35 cs.; F. C. Strype, 7 cs.; Keuffel & Esser Co., 114 cs.; H. Reeve Angel & Co., 2 cs.

Filter

H. Reeve Angel & Co., 46 cs. and 95 bls.; C. G. Euler, 45 bls.; Zinkeisen & Co., 2 cs.; E. Fougera & Co., 109 cs.; A. Giese & Son, 15 cs.; Bank of America, 93 bls.; Orbis Products Trading Co., 35 bls.; National American Bank, 3 cs.; order, 40 bls.

Tissue

Meadows, Wye & Co., 6 cs.; Gallagher & Ascher, 10 cs.; F. C. Strype, 40 cs.; Brooks Paper Co., 3 cs.; T. Meadows & Co., 17 cs.; order, 3 cs.

Photo

Globe Shipping Co., 460 cs.; G. Gennert, 6 cs.; Gevaert Co. of America, 195 cs.; J. J. Gavin & Co., 5 cs.; P. C. Zuhlke, 64 cases.

Hanging

A. Murphy & Co., 3 cs.; W. H. S. Lloyd & Co., 48 bls.; G. W. Sheldon & Co., 14 bls.; American Express Co., 8 cs.; Erstein & Co., 5 cs.; F. J. Emmerich & Co., 12 bls. and 6 cs.; P. H. Petry & Co., 3 cs.; Equitable Trust Co., 1,137 bls.; A. C. Dodman Jr. & Co., 20 cs. and 25 bls.; C. A. Haynes & Co., 11 bls.; F. G. Prager & Co., 24 cs.; Lord & Taylor, 30 cs.; R. F. Downing & Co., 2 bls.; order, 18 bls.

Board

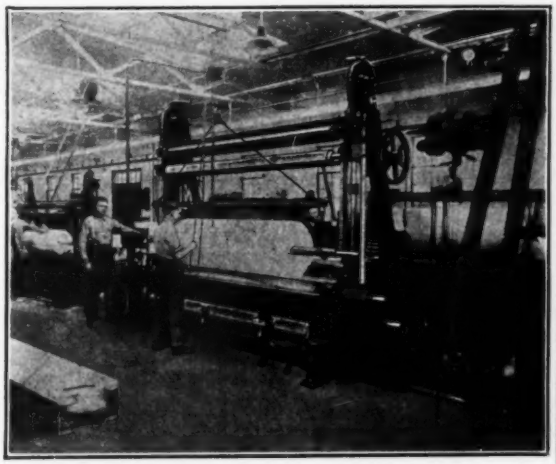
J. P. Heffernan Paper Co., 37 bls.; Traders Paper Co., 208 bls.; F. S. Freed, 9 cs.; Buschmann, Weissberg & Co., 43 rolls; F. G. Prager & Co., 11 cs.; Bendix Paper Co., 48 cs.; F. C. Strype, 15 cs.; Metropolitan Import & Mfg. Co., 98 cs.; Corn Exchange Bank 100 bls.; A. Bourjois & Co., 63 cs.; G. Joseph & Co., 80 rolls; Adrian Vuyck, 462 rolls; R. Reiners, Inc., 10 cs.; American Express Co., 23 cs.; Wilkinson Bros. & Co., 42 cs.; order, 246 rolls, 48 cs. and 50 bls.

Miscellaneous

F. B. Vandergrift & Co., 7 cs.; Whiting-Patterson Co., 46 cs.; Japan Paper Co., 84 cs.; Susquehanna Silk Mills, 2 cs.; Dupont Cellophane Co., 57 cs.; City of Paris Dry Goods Co., 14 cs.; O. G. Hempstead & Son, 3 cs.; Guibont Freres & Co., 43 cs.; R. F. Downing & Co., 2 cs.; Cunard Steamship Co., 40 rolls; Fuchs & Lang Mfg. Co., 23 cs.; Louis DeJonge & Co., 13 cs.; B. Meiners, 10 cs.; Morrison Machine Co., 16 cs.; Favor, Ruhl & Co., 6 cs.; R. Cushman & Co., 2 cs.; Marshall Field & Co., 18 cs.; Martin & Bechtold, 29 cs.; American Express Co., 4 cs.; Judson Freight Forwarding Co., 15 cs.; P. H. Petry & Co., 22 cs.; C. G. Keferstein, 5 cs.; International Forwarding Co., 4 cs.; Borden & Riley Paper Co., 16 cs.; C. W. Williams & Co., 61 cs.; Bernard, Judae & Co., 4 cs.; American & Cuban Steamship Co., 22 cs.

The Jaite Company, Jaite, Ohio, near Akron, is one of the largest manufacturers in the country of heavy paper bags. This company has grown considerably since it was organized about 25 years ago. The great popularity of Jaite Puncture and Waterproof Bags with cement and flour manufacturers has made necessary several additional plant units in the past few years. The Austin Company, engineers and builders, Cleveland, has been awarded another contract by The Jaite Company. The new unit is to be an Austin No. 2 Standard Building 90x130 ft. Construction and material purchases through Cleveland office of the builders.

TRADE
CAMACHINE
MARK
ROLL-WINDERS



Well Worth While—

is this recommendation of CAMACHINE-18 by Mr. Kindleberger:

"Our big winder that is just installed and now running is immensely satisfactory. We consider the buying of this big machine a wise and economical move. The boys running this winder wear a smile that won't come off—something that I have not seen in this mill for years. Parchment Paper is the hardest paper to run over the winder that there is, and this new winder seems to do the trick without any trouble.

"We just cannot help but feel very thankful to you for making a winder that will do the work so nicely.

"Sincerely yours,

"KALAMAZOO VEGETABLE PARCHMENT COMPANY,

"(Signed) J. KINDLEBERGER."

WORDS of praise and approval for work faithfully done are incentives to continued effort. Mr. Kindleberger knows this secret and is generous-minded enough to apply it. Any one of his phrases would make the ordinary testimonial—"immensely satisfactory," "a wise and economical move," "smile that won't come off," "without any trouble," and "feel very thankful to you."

The machine he bought is shown in the illustration above. It is CAMACHINE-18, the modern mill type winder. What it is doing in Mr. Kindleberger's mill it can do in yours. Will you allow us to figure on equipment to suit your particular needs? Your request will bring an immediate written or personal response from us.

CAMERON
MACHINE COMPANY
61 POPLAR STREET BROOKLYN, NEW YORK

MECHANICAL ENGINEER wanted with considerable paper mill experience. Capable handling mill problems, design and field work to fill position as assistant to chief engineer. Must be able and willing to shoulder responsibility. Exceptional opportunity for right man. Give full particulars regarding age, education, training, experience, salary. Enclose small photo if possible. Address Box 67, The Paper Industry.

FOR SALE

Two (2) Fitchburg Steam Engines 40 H. P., 125 lbs. steam pressure; 20 lbs. back pressure; 70 to 125 R. P. M. Length of engine, 12'6"; width of engine, 6'8". These engines can be direct connected or a belt drive and are in A-1 condition.

Three (3) Noble & Wood 1,000 lbs. capacity Beating Engines; wood tub; 48 x 48" roll; 72 x 16½" pulley. These Beaters are in good condition.

Two (2) 63" Smith & Winchester Undercut Paper Cutters.

Address Box 62, Paper Industry.

SUPER CALENDERS CUTTERS WINDERS

One 72" Holyoke, nine roll.
Two 66" Holyoke, nine roll.
One 52" Holyoke, nine roll.
One 48" Norwood, seven roll.
One 45" Holyoke, nine roll.
Five 60" Hamblet cutters equipped with Moore & White layboys.
Three 70" and two 54" Moore & White sheet Cutters.
Moore & White four drum winders: 118", 114", 102", 99", 72".
One 80" Pusey & Jones slitter and winder.
One sulphur burner, Glens Falls, 48" x 15' 6".

For Sale by

FRANK H. DAVIS COMPANY
175 Richdale Avenue, Cambridge, Mass.

1—5 H. P. W. A. Jones Speed Reducer ratio 143 to 1—2.
1—Connersville Blower 7 lb. pressure 16½ cu. ft. displacement per revolution.
Root Blowers Nos. 1, 2, 3, 4, 5, 5½, 6. 1 to 5 lbs. pressure.
Electric Hoists—½, 1, 2, 3, 5 tons capacity.
Air Hoists and Air Compressors.

Scully-Jones & Company
3615 South Ashland Avenue CHICAGO

Quality Guaranteed

The Smallwood-Low Stone Co.
Lisbon, Ohio
U. S. A.

IF WE CAN MAKE RUBBER PRESS ROLLS

[SNAPPY AND TOUGH]

THAT TAKE MORE WATER OUT
THAT ARE EASIER ON THE FELTS
THAT STAND UP BETTER BETWEEN GRINDING

Than what you are using, it would pay to send your rolls to us if we were three thousand miles away. Some mills are doing this.

STOWE & WOODWARD COMPANY

The Rubber Roll Makers

NEWTON UPPER FALLS, MASS.

Foreign Trade Opportunities

Additional information regarding the following foreign trade opportunities issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce may be obtained from the Bureau in Washington, D. C., or its branch offices. It is requested that the number of the inquiry be given at all times.

No. 10744—Oil linen and oil paper. Amsterdam, Netherlands. Agency desired.

No. 10784—Soda, caustic and soda ash. Iquique, Chile. Purchase desired.

No. 11024—Cardboard, tarred. Como, Italy. Agency desired.

No. 11023—Paper. Bombay, India. Purchase and agency desired.

No. 11029—Paper, typewriter and mimeograph. Manila, Philippine Islands. Purchase desired.

No. 11030—Paper and stationery supplies. Athens, Greece. Agency desired.

No. 11031—Paper goods such as tapestries, blinds, curtains, collars, cuffs, napkins and table covers. Liege, Belgium. Agency desired.

No. 11042—Photographic paper. Vienna, Austria. Agency desired.

No. 11006—Sanitary paper ware. Bahia, Brazil. Agency desired.

American Waxed Paper Association Organizes

The manufacturers of waxed paper have organized into what is known as the American Waxed Paper Association. The membership represents a very large proportion of the tonnage of the United States.

The Association's program is based primarily on the idea of service to the consumer.

The importance of this industry and the necessity for protecting the public by the development of standards of raw materials and finished products shall insure the delivery of clean food, inasmuch as a very large proportion of the tonnage of waxed paper is used in the protection and preservation of food in some form or other.

The Association's Plan of Activities

As almost the entire tonnage of waxed paper manufactured in the United States is used for the protection and preservation of food, this Association recognizes that it has a prime duty to the public to so regulate the methods and materials employed in the manufacture of its product that it shall be sanitary and suited for food uses.

The Association's program includes the following:

1—Development of an effective Credit Bureau Service.

2—Establishment of Trade Customs that will be fair and reasonable for both the manufacturer and the consumer of waxed paper and waxed paper products.

3—Development of standards of waxed paper, waxed paper products and raw materials used in their manufacture that will be recognized by the industry, the trade and the ublic.

4—Establishment of a Research Department to further the development and use of waxed paper and waxed paper products.

5—Providing the industry with a means of settling disputes by arbitration.

6—Advertising the Association to the consumers. The Association will distribute through its members brief bulletins on various grades of waxed paper informing its customers as to the proper qualities to be used for the special merchandising or purposes developed by the Research Department of the Association.

The Association will work towards the protection, promotion and perpetuation of the waxed paper industry of the United States. It will cultivate the confidence of the consumer of waxed paper and endeavor to make its membership prized and of value to all reputable manufacturers of waxed paper and waxed paper goods.

The Association has been doing some most aggressive work in developing its Credit Bureau Service, trade customs, etc. A meeting recently in Chicago is to be followed by another in New York on July 22d, when reports of its Printing Costs and Research Bureau committees will be considered.

The work of this Association is being handled from the offices of the American Paper and Pulp Association, with O. M. Porter, assistant secretary of the central organization, as secretary of the waxed paper group.

The Robert Gair Co., is installing a 2,000 horse power engine at its Haverhill Division in Massachusetts. This work will include new beater line shafts, main drive and building changes. Karl A. Lefren of N. Y. is consulting engineer.

Dependable Used Equipment

3—Dorr re-action tanks, 10'x10', complete with agitators and steam coils.

500—Steel storage tanks, 119 to 28,200 gallons, ⅜" to ⅝" plates. Write for Bulletin No. 7.

1—40 KW Sprague Electric Works direct current generator, 120/125 volt, compound wound.

1—G. E. 75 K.W. motor driven exciter set, generator compound wound. Form A, Type RC-16, 600 Amp., 125 volts D.C., 1200 r.p.m.

125—Motors, ¼ to 150 h.p. Write for Bulletin No. 21, listing our complete stock of electrical equipment including condulets, motors, generators, lightning arrestors, etc.

17—New Roberts filter tubs, 17' dia. x 7' depth, capacity each 454 gallons.

65—Used tubs, same as above.

5—14" Class B Worthington double suction enclosed impeller (volute) centrifugal pumps, 16" suction, 14" discharge.

3—Allis-Chalmers 14" Type S Centrifugal pumps.

6—Allis-Chalmers 16" Type S Centrifugal pumps. Write for Bulletin No. 22, Waterworks Equipment.

1—Otis freight elevator, 3,000 lbs. capacity, 81 ft. travel, car 11'7"x7'11" and 12'9" under beam.

1—Otis freight elevator, 6,000 lbs. capacity, 36'2" travel, platform 10'x10'2".

31—Continental Iron Works welded steel digesters, capacity 1,300 cu. ft., pressure 110 lbs.

12—Kellogg hammer welded steel Autoclaves 300 lbs. working pressure. Tested to 1,000 lbs.

16—823 h.p. Babcock & Wilcox Stirling Water Tube Boilers, 200 lbs. pressure, Class M-30, complete with Westinghouse stokers, forced draft fans, Vulcan soot blowers and all accessories.

2—300 h.p. Heine boilers, 150 lbs. pressure, Murphy stokers and accessories.

10—Connersville 26"x36" horizontal top discharge gas blowers. Capacity 24.5 cu. ft. per revolution at 4.58 lbs. per sq. in. at 255 r.p.m.

6—18"x36" Allis-Chalmers heavy duty mill type Corliss engines.

2—15 and 26x20x24 Compound duplex Laidlaw compressors. Pressure 80 lbs. Capacity 2,570 cu. ft. at 150 r.p.m.

2—42x11½x50 hydro pneumatic accumulators, designed for 300 lbs. air service. Equipped with Watson Stillman automatic regulators.

3—8" 3-stage Alberger-Curtis steam turbine driven boiler feed pumps.

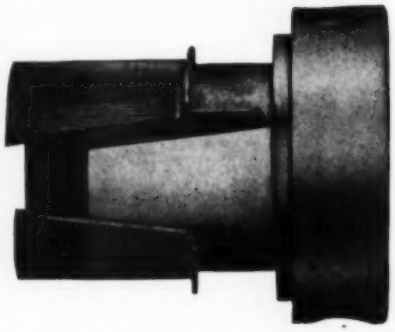
Write for Prices and Specifications

Inspection invited to our stock of desirable slightly used equipment from the Old Hickory Powder Plant.

Nashville Industrial Corporation

OLD HICKORY TENNESSEE

THE ONEIDA CHUCK for use with Paper or Strawboard Cores



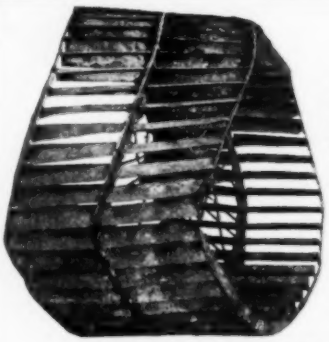
This chuck is so designed that it cannot split or damage the paper core on which the paper is wound and allows the roll to be run down to the last thickness of paper.

The conical or wedge-shaped chucks now commonly used with paper cores invariably split the paper cores so that from ½" to 1" of paper next to the core is damaged. The elimination of this waste will soon pay for the equipment on each machine.

Our Chuck allows the use of a cheap non-returnable paper core that once used can be thrown with the waste and sold.

Let us make up a trial set for you

ONEIDA CHUCK COMPANY
RHINELANDER, WISCONSIN



This blast wheel is an extraordinary demonstration for the strength of Plexiform construction and bears out the claim of Bayley engineers—proven many times by less severe tests— that Plexiform construction has the maximum of structural strength, though comparatively light in weight.

STRENGTH

This wheel was crushed under tons of debris when a four-story building collapsed upon it.

Not a rivet was broken, not a joint loosened, nor a fracture in any part.

Strength of materials is sometimes proven by unusual tests, by strains out of all proportion to those experienced in actual use. 21

Bayley
Manufacturing Company
734 Greenbush Street
MILWAUKEE

Two sections of an 8-ft. x 24-ft. Biggs Cylinder Rotary Boiler after leaving the riveter. This riveter has a gap of 18 ft. 6 in. and drives rivets 1½ in. diameter under 150 tons hydraulic pressure.

Globe and Cylinder Rotary Bleaching Boilers — Digesters — Riveted Steel Tanks—Flumes, Smokestacks, Penstocks, General Steel Plate Construction of every description.

Biggs Rotaries Endure

GLOBE and cylinder rotaries installed by Biggs over thirty years ago are still in active service, delivering the goods satisfactorily.

That is a wonderful record when you stop to think what it means. Thirty odd years of cooking and bleaching, under all sorts of conditions, with exceedingly low maintenance costs, according to owners' statements.

Such equipment pays for itself many times over. Paper mill superintendents everywhere are quick to recognize such performance and the wise ones take advantage of Biggs quality and Biggs experience when they purchase rotary equipment. No wonder Biggs has a very high percentage of repeat orders.

THE BIGGS BOILER WORKS COMPANY
Seneca Place and Case Avenue **Akron, Ohio**

Eastern Representative: Mr. Grenville A. Harris, 15 Park Row, New York City.

BOILER WORKS The Biggs CO. EST 1887 AKRON OHIO

GLOBE and CYLINDER
ROTARY BLEACHING BOILERS
for Years of Dependable Cooking and Bleaching